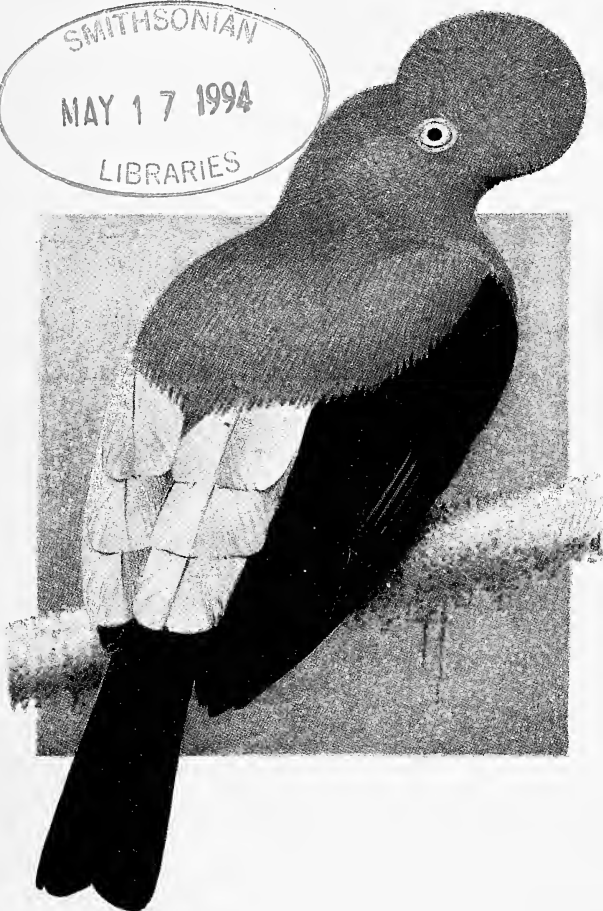


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AVICULTURAL MAGAZINE



VOLUME 100
No. 1
1994

CENTENARY YEAR

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THE AVICULTURAL SOCIETY

The Avicultural Society was founded in 1894 for the study of British and foreign birds in freedom and captivity. The Society is international in character, having members throughout the world.

Membership subscription rates per annum for 1994 as for 1993: British Isles £18.00: Overseas £21.00 (plus £6.00 for airmail). (U.K. funds please). The subscription is due on **1st January of each year** and those joining the Society later in the year will receive back numbers of the current volume of the AVICULTURAL MAGAZINE.

Subscription, changes of address, orders for back numbers etc. should be sent to:

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THE AVICULTURAL MAGAZINE welcomes original articles that have not been published elsewhere and that essentially concern the aviculture of a particular bird or group of birds, or that describe their natural history. Articles should be preferably typewritten, with double spacing, and the scientific names as well as the vernacular names of birds should be given. References cited in the text should be listed at the end of the article. Line drawings should be in Indian ink on thick paper or card; black and white or colour photographs which illustrate a particular point in the article will be used where possible and should be clearly captioned. If authors wish their eventual return, they must say so when submitting the article and write their name on the back of each photograph.

ADDRESS OF THE EDITOR

Frank Woolham, Hon. Editor, The Avicultural Magazine, 32, Caughall Road, Upton-by-Chester, Chester, CH2 1LP. England.

AVICULTURAL MAGAZINE

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EDITORIAL

I am certain all members of the Avicultural Society will wish to be associated with these words of appreciation to my predecessor as editor of the magazine, Professor J. R. Hodges. I suppose it is only *really* possible to appreciate the effort that goes into producing a publication like the *Avicultural Magazine* if one has some insight into the demands such a 'calling' can make on one's time - and temper!

Since I have spent much of the last three decades editing and overseeing the production of a variety of industrial publications I was fairly well prepared for the task in hand. However, I totally concur with Bob Hodges' comments in his editorial in 1993's final issue that '...it is hard work, time consuming and often boring' - although I am happy to confirm that, thus far, the last thing I have been is bored!

Let us not underestimate what Bob achieved during his three-year occupation of the editorial chair. When he took over the reins the situation confronting him was far more daunting than that with which I have been coming to terms over recent months. The magazine was appearing only intermittently, to the considerable irritation of many members, and much had to be done to restore editorial integrity and frequency of publication.

He did not spare himself to achieve those objectives as rapidly as possible - and having done so, he turned his energies to the task of consolidating the position. The result, and I shall be eternally grateful to him for it, was that he was able to pass on to me an editorial operation not only in pristine condition, but running as efficiently as a thoroughbred watch.

During the hand-over period - which had to be undertaken at long distance because of my other work commitments - he devoted considerable time and trouble to ensure the transition was as smooth as possible. He has worked tirelessly on behalf of the

Avicultural Society and I am glad to have this opportunity to express thanks to him on behalf of all members.

It is gratifying, at this stage, to have received a substantial amount of material and I hope the momentum will be maintained in the months ahead. That the Society's long-standing international character is maintained is clearly essential and I am delighted to see, among recent submissions for the magazine, contributions from the USA, Singapore, the Philippines, South Africa, Italy, Germany and the UK.

I welcome the prospect of having a broader spectrum of readers contributing to these columns. If they have not already done so, prospective contributors should first look at the information on the inside front cover which sets out in clear terms the type of material that is sought. On the other hand, if any member has interesting and original observations to pass on but is uncertain about any aspect of its preparation, then please write to me at the address also given on the inner back cover.

Thanks to some good housekeeping at the Society's Bristol Zoo headquarters, it has at long last been possible to restore colour illustrations to the Avicultural Magazine. The four centre pages will be used for this purpose in each issue during 1994 - Centenary Year - and we will hope to continue after that. Much depends on whether it is possible to raise extra revenue by publishing selected display advertisements.

Colour is costly and I make no apologies for emphasising that only top quality illustrative material will be used; to reproduce substandard prints or transparencies would be a waste of the Society's (and indirectly, members') money. In addition to slides, etc. submitted by members, Dennis Avon, whose work will be familiar to many, has kindly agreed to provide colour transparencies, without fee, for reproduction in the magazine from time to time.

May I also put in a plea for contributions to News and Views, and also express the hope that better use is made of the opportunity for members to place classified advertisements in the magazine. The latter items are an important element in a publication such as this and any intended for the next issue should reach me not later than 4th April, 1994.

BREEDING THE CAPUCHINBIRD

By Ed Lewins, Lauro Ordonez and Wayne Schulenburg
(Bird Department, San Diego Zoological Society)

The Capuchinbird or Calfbird *Perissocephalus tricolor* is a little known member of the Cotingidae. Like its better known relative, the Cock-of-the-Rock *Rupicola rupicola*, it is a crow-sized bird with a large and powerful bill, short tail and strong legs. The species is predominately coffee-brown to cinnamon in colour with blackish wings and tail, contrasted with the bare blueish-grey skin of the head. Distribution of the Capuchinbird is limited to the Guianas, Venezuela south of the Orinoco, and adjacent areas of Brazil north of the Amazon (Snow 1971).

This species, unlike most of the other cotingas, is not considered dimorphic; however, it has been our experience that females have been smaller in overall size and weight. The females in our collection range in weight from 233 - 271 grams, while the male ranges in weight from 272 - 349 grams. The sexes also seem to differ in vocalisation, males producing an extended two-toned call while the female produces a shorter, more raspy monotone call.

In early 1988, the San Diego Zoological Society received a single specimen which was determined, through surgical sexing, to be a female. In 1990 four more individuals were obtained. After a 30 day quarantine period, they were also surgically sexed and determined to be a male and three females, giving a total of one male and four females.

We were disappointed in this sex ratio because the Capuchinbird is a lek species. Several males display in close proximity to each other, while the females observe from the perimeter. After selecting a male, a female flies to her chosen mate's display perch where copulation usually occurs. Even though the females nest in relative close proximity to the lek, the males are believed not to participate in nest building, incubation or chick rearing (Snow 1971).

In February, 1990 we set up a single pair of Capuchinbirds rather than housing all five birds together. The decision was made on the limited enclosure space available. The exhibit chosen is an outside enclosure measuring 3.7 m x 6 m x 3 m. The rear wall is concrete with two doors leading into ante-rooms used as keeper access. The back 72.6 cms is covered by a concrete roof, while the rest of the

enclosure is covered with 1.3 cm x 2.5 cm 12-gauge galvanised welded wire.

The enclosure contains a wide variety of plant life analogous to those found in their natural rainforest habitat. The plants consisted of a single specimen of *Ficus elastica*, *Clivia minita*, *Thunbergia grandiflora* and *Hibicus rosa-sinensis* spp. These plants were positioned in such a manner as to create thick to moderate foliage in the rear and sides of the exhibit with the centre area being more open in the hope of creating an arena for possible courtship displaying.

This enclosure also houses several other species of neotropical birds: Silver-throated Tanager *Tangara icterocephala frantzii*, Bay-headed Tanager *T. gyrola*, Golden-masked Tanager *T. larvata franciscae*, Orange-billed Sparrow *Arremon aurantirostris rufidorsalis*, Red-legged Honeycreeper *Cyanerpes c. carneipes* and Bare-faced Ground Dove *Metriopelia ceciliae*.

The diet for birds in the enclosure consists of a diced fruit mix (apples, papaya, grapes, and boiled long-grain brown rice), an avocado slice, crickets, mealworms *Tenebrio molitor*, mega worms *T. obscurus*, anoles *Anolis anolis*, pinkie mice, soaked Purina Hi-Pro dogchow and Zeigler Low-iron pellets. Blair's Super Preen powdered vitamin/mineral supplement is sprinkled on the diet. The doves are also provided with a finch seed mix consisting of millets and niger.

The male and one female were set up in February, 1991. Beginning early that spring, the male began courtship vocalisations as described by Barbara Snow in her 1972 observations of two lek sites in Guiana (Snow 1972). Even though the male continued to vocalise throughout the year there was no apparent response by the female until 17th July, 1992. It was on this date that a twig platform was discovered in the thick tangles of a *Thunbergia* vine at approximately 1.8 m above the ground in the back of the exhibit.

The platform was constructed of *Melaleuca* spp. twigs that were part of the mulch used to cover the ground in the exhibit. The twigs used for the base of the platform were approximately 6 ins (15cm.) in length. Since similar twigs were not abundant in the exhibit, more were offered. The female was observed carrying the twigs to the platform structure, expanding it in both diameter and height until it was nearly 22.9 cm in diameter and 7.6 - 10.1 cm thick. The nest structure was loosely constructed and remained a platform with only a slight indentation for an egg.

During this period the male continued to call and to solicit the

female, occasionally following her to the nest site. This seemed inconsistent with the known behaviour of other cotinga and lek species and proved detrimental to the success of the first egg which was laid on 7th August, 1992. At approximately 9.00 am, both birds were observed in the nest in what appeared to be a skirmish. The male left the nest site and returned to his display area. The female was then observed flying to the front of the enclosure with an eggshell in her beak, dropping it to the ground.

After this failed attempt at nesting, the female showed no interest in either the male or the nest. This was not, however, as surprising as the decrease in vocalisations and courtship displays by the male. This absence of breeding behaviour continued for approximately the next seven days, after which the female once again began to exhibit interest in the nest. Almost simultaneously, the male began to increase his vocalisations and displays.

Suspicious that the female was about to recycle, we began to watch the nest activity very carefully so that, if necessary, we could intervene. On 24th August the female was observed sitting in the nest - leaving immediately upon disturbance by the keeper. It was at that time that an egg was confirmed. Observations were then made from the front of the enclosure in order to lessen interference.

The male began to pursue the female and she appeared to be nervously avoiding the nest area. This continued for about 20 minutes when it was decided to remove the male from the enclosure and put him in the adjacent exhibit. Even with this arrangement the female continued to appear nervous and unwilling to return to the nest, and continually watched the male.

After approximately 15 minutes it was decided to move the male to another area of the zoo so the female could not see or hear him. She spent the next 10 minutes apparently looking for the male. It was only after this that she seemed to relax and returned to the nest and began to incubate. Throughout the 26 days of incubation the female would leave the nest upon any keeper disturbance in the exhibit or in the adjoining enclosures. This allowed for a daily visual check for the integrity of the egg, which was cream-coloured and covered with spots and blotches of dark brown to dark reddish-brown. It measured 27.5 mm x 32 mm.

Three days before the anticipated hatch, a video camera and monitor were set up in the adjoining enclosure. This allowed observation without disrupting activity at the nest. On the morning of 17th September, the 25th day of incubation, a pip was discovered. All disturbance was kept to a minimum throughout the day and the

nest was not examined again until the next morning.

At 6.30 am on 18th September, the 26th day of incubation, we had our first view of a Capuchinbird chick. Not knowing how the female would react to our intrusion and handling of the chick, we decided not to weigh it for the first several days. During this time the female continued to leave the nest when the keeper entered the enclosure, so on the fourth day we decided to take advantage of her absence and remove the chick for weighing.

Covered in long bright orange-chestnut down, the chick weighed 26 grams and was 7.6 cm in length. Its most striking feature was the enormous breadth and gape of beak.

The chick was fed predominately protein with the most frequently offered items being mealworms, mega worms, anoles and pinkies. When feeding anoles, the female was observed putting them into the youngster's mouth, removing them and then, after swallowing them herself, giving them back to the chick. Even from the first week, the chick appeared to take them without trouble.

On 26th September, nine days after hatching and having attained a weight of 64 grams, the chick's eyes began to open and feather tracks on the wings and back were becoming visible. On day 26, the youngster was fully feathered and with the exception of two cranial tracks extending from the crown of the head down to the cere, was identical to the adults.

CAPUCHINBIRD WEIGHTS

Day	4	- 26 grams	22 September
	9	64	26 September
	15	124	3 October
	20	159	8 October
	22	164	10 October
	24	165	12 October
	26	174	14 October
	29	184	17 October
	41	223	29 October
	52	249	9 November
	61	260	18 November
	76	246	21 November
	80	269	7 December
	87	272	14 December
	94	256	21 December
	117	259	13 January
	131		27 January (female refused to feed chick)

At 29 days the young bird left the nest weighing 184 grams. Rather than flying, however, it climbed through the vines. Actual

flight was not observed for approximately another week.

At day 61, the fledgling was observed for the first time at the food pan, where the female fed it some fruit. It was not until day 64 that the chick took food from the pan by itself. On day 131, when it weighed approximately 269 grams, the female refused to feed the chick.

On 2nd March the young Capuchinbird weighed 259 grams. It was surgically sexed as an immature female and moved to another enclosure.

The male was returned to the enclosure housing the breeding female after a two-week introduction period in an adjoining enclosure. Another adult female has been placed in an adjacent enclosure. If this second female appears receptive to the male, we will be able to allow him access to her giving us the possibility of two nesting females.

REFERENCES

- SNOW, B.K. 1972. 'A Field Study of the Calfbird *Perissocephalus tricolor*'. *Ibis* 114 139 - 162.
- SNOW, D. W. 1976. *The Web of Adaptation*. Quadrangle/the New York Times Company, Inc., USA.
- SNOW, D.W. 1982. *The Cotingas*. Omstock Publishing Associates, a division of Cornell University Press, Ithica, New York.

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JEAN DELACOUR AND THE AVICULTURAL MAGAZINE PART 1: 1916 - 1919.

Josef Lindholm III Keeper II/Birds, Fort Worth Zoological
Park

As the Avicultural Society approached the end of its first quarter century in the gloom of the First World War, Mrs. E. Johnstone, herself a great aviculturist, the first to both keep and breed the Mikado Pheasant and the Mt. Apo Lorikeet (named *Trichoglossus johnstoniae* in her honour), forwarded a letter, written in French, to the *Avicultural Magazine*. Its editor, the eminent Hubert Astley, presented the following extract, here reproduced in full:

‘Mrs. Johnstone sends a letter from M. Delacour in France, in which he writes that although his château was invaded by Germans in September last, he only lost a few birds; amongst which were some rare waxbills; through the aviary doors being left opened.

M. Delacour successfully bred Buffon's Touracos last year, and also *Columba speciosa*, as well as a great many hybrid Mikado-Elliott Pheasants. He remarks “je crois que personne n'avait jamais élevé de touracous; les Jeunes sont maintenant pareils aux parents.”

Of course M. Delacour is mistaken, for Mrs. Johnstone herself was successful in breeding touracos at Burrswood.

(A French aviculturist in the War Zone. February, 1916. (Series III) Vo. VII, 120.)’

There were members of the Avicultural Society introduced to the 25-year-old Jean Delacour, who joined the Society in 1916. Given that this note is largely written by the Rev. Astley it is, none-the-less, considered the first of the 281 articles by Dr. Delacour which appear in the pages of this magazine, spanning all four quarter centuries of its publication, the last appearing in 1982 (Gibbard, 1988, Lindholm, 1988). It is my intention to present, in this Centennial Volume of the *Avicultural Magazine*, excerpts from at least one of Dr. Delacour's articles from each of the 64 years that he wrote for it, and thereby give an overview of aviculture during this time, as these writings not only cover his own extraordinarily diverse activities, but those of private and public collections around the world.

Appended to the second of Lieutenant Delacour's contributions to the magazine, a detailed account of his propagation of *Tauraco*

persa buffoni, is a note by the Rev. Astley, which I believe has been largely overlooked; though I have discussed it previously (Lindholm, 1987). Mr. Astley (who would shortly be one of Delacour's closest friends), states that the female Touraco, and likely the male as well, were the same birds that bred for Mrs. Johnstone in 1904, the first captive breeding for the family (Johnstone, 1904). She identified her birds as *T. macrorhynchus*, a designation one continues to see in print (Rutgers and Norris, 1972). Delacour (1925) himself considered his birds and Mrs. Johnstone's to be separate species, so perhaps they were, but from what we now know of the touraco's remarkable reproductive longevity, it is certainly not impossible that the world's first captive breeding pair may have continued to produce chicks at Villers-Bretonneux until their destruction in 1918.

'In the month of April of 1914, Monsieur Robert Pauwels let me have a pair of Buffon's Touracos which he had retained after the sale of his magnificent collection ... at Everberg (Belgium). He had had these birds in his possession for some years. They were in beautiful condition, but had never yet nested in his aviaries. Directly they arrived at Villers-Bretonneux, I installed them in an outdoor aviary ...

'In June, two months after their arrival, I found on some straw in the nesting box beneath the shelter, two round white eggs the size of those of a Golden Pheasant. Male and female incubated them alternately, and in 18 days two young were hatched ... The parents took great care of them, but on the eighth day I found them dead upon the ground. I fancy it was the father who had done the deed ...

'Three days afterwards two new eggs were laid in the same nest, which was always kept beautifully clean. The young were hatched in the month of July. After a few days, one was found dead on the ground. I then removed the male bird from the aviary, but his mate at once abandoned the remaining young one, which died. The parents showed pleasure when they were reunited. It was just then that war was declared, and I left Villers-Bretonneux on the 1st August (1914). I remained without news of my birds until the end of September, only knowing that the Germans had arrived at my home on the 30th of August, and had been driven out on the 12th of September, without having done great damage to my aviaries. (They had, however, killed a white Rhea, some rare waxbills, some sunbirds, etc.)

'In the month of October, my Mother, who occupied herself

actively in my absence with my birds, wrote to me that the touracos had again laid in the month of August, and the young ones had been born during the Germans' invasion! One was dead, but the other was then more than a month old. The parents had taken good care of it, the male bird having done it no harm. The nestling lived until November, but it was rickety, with malformed feet. It died. The parents were then placed in the heated compartment until the following May.

'The following are my Mother's notes on the touracos during 1915:-

'In the month of June, the female laid two eggs in the same nest as in the preceeding year, and two young ones were hatched. They were thrown out and found dead on the ground after a few days. The second clutch was laid immediately, and two young were hatched on the 10th and 12th of August respectively. This time the parents took good care of them, and on the 5th of September, the strongest of the two left the nest and was found perching upon a bush. It was still very small, and covered with black down, and lacked the crest. But it flew fairly well, as it had some partly grown flight feathers which were black in colour; and returned every night to the nesting-box.

'On the 20th of September its crest began to show, and its feathers grew, some red quills appearing in the wings. The other young one was rickety like that of the preceeding year, and never left the nest. It died at the beginning of October ...

'When I went on leave to Viller-Bretonneux in January 1916 I found the young touraco exactly resembled its parents; the three birds were always very united, and the parents allowed the young one to take the pieces of banana which were given to them, first ...

'The young touraco began to feed itself at about the age of six weeks; the two birds fed it by regurgitation, after the manner of pigeons and parrots. We always give our touracos the same food even when they have young ones; namely bananas, potatoes chopped in pieces and dry raisins ...

'To sum up, this is what my pair of touracos have produced:
1914. Three nests. Six eggs. Six young ones, one of which survived for two months.

1915. Two nests. Four eggs. Four young ones, one of which lived two months, the other has become adult.'

(Breeding of Buffon's Touracos in France *Turacus buffoni*) June 1916 (Series III) Vol. VII, 211-214.)

'Dear Sir, A friend has given me some insects to be bred as a

food for insectivorous birds; they are *Carausius morosus*. I am told that these insects are now given to the birds at the Zoological Gardens. Can you tell me if they are good for them, and if they would be suitable for my Paradise birds, Motmot, Toucans, Thrushes, etc. The insects eat ivy leaves.

Yours, etc ... Jean Delacour (France).'

(A beetle (?) for breeding as food. November, 1916. (Series III) Vol. VIII, 42.)

The Rev. Astley appended; 'I wrote to Mr. Seth-Smith, Curator of Birds at the London Zoological Gardens, who replied that he does not know this insect. Can any member enlighten us? Is it a beetle?' In reply came a somewhat ascerbic note from Pierre Amédée Pichot (1916), to the effect that this species is a stick-insect *Orthoptera*, and that "... *The Field* published some time ago a note from the London Zoological Gardens stating that stick-insects had been given for food not only to the birds, but also to some ... mammals, such as Marmosets ..."

'Although my departure for the Army dated from August, 1914, I was able that year to see something of my birds: a convalescence, some leave, and above all, the chance that brought me near home during the summer, gave me the opportunity of paying fairly frequent visits, and to obtain fleeting glimpses of them.

'I came to the conclusion that the close proximity of the battles had no bad effect upon my birds, except that a much greater number of eggs were unfertile, a fact which is no doubt annoying, but not important on the whole. Considering their nearness to the "front" during more than two years, the essential point was not so much the increase of their numbers as the decrease. The coming and going of aviators, their fights, the appalling bombardment in the near neighbourhood seemed to trouble the birds very little and to cause no damage ...

'Up till now an Ostrich has laid four eggs, whilst her mate has become more and more wicked, and has several times attacked his keeper. Neither have they suffered from the snow in which they walked about for a fortnight at the end of the winter, only going into their unheated shed for the night.

'...The Egrets, *egretta* and *candidissima*, have their enclosure, but have evinced no inclination to nest. Although they never have fish to eat, they are in perfect condition. The smaller waders, such as Ibis, Gallinules, Ruffs and Reeves, Turnstones, Plovers, etc., keep in good health ...

'There is nothing of interest to note with regard to the water-

fowl, very little reproduction and few deaths. Some are full-winged, and only fly to escape from any danger. The Barnacle and Maned Geese have not laid, nor yet the Ringed Teal. There is a little company of Falcated Duck on the water, which give a fine effect.

'...Buffon's Touracos have reared a young one under the same conditions as in 1915, after having destroyed their first clutch of eggs, and as I write (October, 1916) a third clutch has been laid.

'... The Toucans have lived for more than three years, and are in fine plumage; they do not leave their large compartment in the heated corridor.

'The five species which I possess have all the same habits, and are very tame and amusing.

'These birds are not infrequently ailing, remaining for several days without eating, and their feathers ruffle, having no power to hold on to the perches.

'Other species of birds would succumb under such circumstances, but the Toucans, on the contrary, recover after a few days, so that I am not very anxious when it is reported to me that one is ill.

'... A few words as to the Paradise-birds. Alas, they only number three specimens: an immature male of the Greater Paradise-bird *Paradisea apoda*, and two males, one adult, the other approaching that stage of Wilson's *Schlegelia wilsoni* ...These, along with the Sunbirds, came to me from the collection of the Marquis de Segur, which he had in Paris ...'

(Notes on my birds at Villers-Bretonneux in 1916. January, 1917. (Series III) Vol. VIII, 69 - 73.

The article from which the above was excerpted was accompanied by the last installment of an inventory, with comments, by the Chevalier Debreul (originally published in the journal of La Société Nationale d'Acclimation de France) of Delacour's birds. The first installment appeared in pages 34 - 41 of Vol. VIII, while the second ran from page 58 to 60. A total of 1,345 specimens of 344 species and subspecies were at Villers-Bretonneux as of June, 1916.

'I received four Red-crowned Pigeons *Pigeons hollandais* in the spring of 1914, three males and one female, which were in fairly good condition, although evidently worn by their voyage ... I installed them in an aviary in the heated corridor, where they settled on a branch, nestling one against another, preening and arranging their feathers, and only leaving their perch to fly to the food-tray, from which they ate greedily and copiously of rice boiled in sweetened milk, with bananas and other fruits cut into small

pieces ...

'Indeed, the Pigeons regained their health so much that I found their aviary in a state of confusion one morning; one of the male birds was hunting and knocking his companions about, who, frightened, were crouching in the corners. This seemed to me curious, considering that up till then the three males appeared to be the best of friends and apparently attached to each other. I removed the aggressor, but the two remaining pigeons fought, so that I had to place each one in a separate flight.

'I then made an attempt to put the female with each of the males in turn, but without success, for she would have been quickly killed had I left her to the fury of their attack on her.

'Each of the four birds was consequently put by itself at the time that the war broke out.

'For a year I saw them no more!

'When I had my first leave home, in July, 1915, I found that one of the pigeons had died, whilst the others appeared to be in very bad health, their plumage and their bills soiled. I at once put them in an open-air aviary communicating with a heated compartment and had the satisfaction of seeing them benefiting by the change after a few days ... I feel certain that fresh air and space is absolutely necessary in order to keep them in good condition.

'Unfortunately it has been impossible to leave the female with one of the males, and consequently one has no hope of their breeding.'

(The Red-crowned Pigeon *Alectroenas pulcherrima*. March, 1917. (Series III) Vol. VIII, 139 - 141).

'Last winter was certainly the coldest I ever experienced at Villers-Bretonneux (Somme) since I have kept birds. Up to January 20th the weather was soft and rainy; afterwards a little snow fell, and it froze hard until the middle of February; about every night the thermometer indicated -15°C and more.

'The ice in the pond exceeded 45 cm., and all the birds kept out of doors had only ice or snow to slake their thirst.

'All that time the sun shone and the wind blew only the last week; and the war prevented the cold from being mitigated on account of want of coal, etc.

'{Among the} the birds {which} bore the cold weather outdoor without any shelter and are in good health:

'... Ducks and Teal (even ringed Teal), ... and even six young "Spicifer" {Burmese Green peafowl} recently imported, which were displaying on the ice ... Goffin's, Leadbeater's and Rosy-

breasted Cockatoos; Swainson Lorikeets; Black-headed Conures; Senegalese Parrots; Pileated Parrot *Peonopsittacus* [sic] *piliatus*; Adelaide Pennant's, etc. Parrakeets; Red-billed Liothrix; Virginian Cardinals; Black Cowbirds *Moluthrus bonariensis*; and numerous Weavers (Madagascar, Orange, Crimson-crowned, etc.)

'The cranes, storks, etc., were out of doors during the day, but driven into an unheated house for the night. The ostriches and white Rheas remained in their unheated shed, whose windows were opened in the morning. The macaws and other parrots and parakeets lived well in an unheated room and bore the frost every night without harm. The other birds remained in the heated house when indeed the thermometer indicated sometimes only 4 °C. In spite of this ... , sun and sugar birds, tanagers, etc. never had any disease; two birds only died of pulmonary illness, but perhaps the most valuable - they were both the Wilson's Paradise birds. it is a great pity, for they were in such good condition. The great Paradise bird did not suffer.

'... Some Great Egrets, stupidly kept out of door during the first days, and though sheltered afterwards, soon died, as well as some pochards and Tufted Ducks, which had no water to swim in; the Black-necked Swans, Variegated Sheldrakes, Black-backed [Brant] Geese, and all the tree ducks, kept indoors only at night-time and out of doors by daylight, died also. The American Black-backed Geese lived well ...'

(Exotic Birds' endurance during a cold winter (1917) in Northern France. July, 1917. (Series III) Vol.VII, 139 - 141.)

'The war and the submarine campagne have hindered the importation of exotic animals into France, but they have not entirely stoped it. Thus it was that I was able to receive at the beginning of the year a very interesting package from the Gaboon, in which was found a superb bird - the Great Touraco.

'The different Touracos are always rare enough in collections, in spite of their hardy temperament and their readiness to breed in aviaries. I even believe that people had never hitherto seen a live specimen of the Great Touraco.

'One feeds it on bananas, apples and other fresh fruit, on diced figs and raisins, and meat cut small. It refused mealworms, *Caurasius*, and other insects ...'

(The Great Touraco *Corythaeola* vel *Schizorhis cristata*.. March, 1918 (Series III) Vol.IX, 152 - 153.)

'I am ... particularly happy to be able to announce that a young "Pigeon Hollandais" has been born and reared at Villers-Bretonneux

... This year, at the end of May, it was noticed that the hen was carrying pieces of straw in her beak, and manifested a good deal of agitation; and so I had the idea of opening the door between the compartments. The two birds straightway approached each other and were soon united.

‘Two days afterwards one egg was laid under a shelter in a basket, where the pigeons had already placed a little dry grass. This egg was rather large compared with the size of the bird, and longer than those of doves in general; it was white, with a very delicate shell. The parents sat most assiduously, after replacing one another on the nest, but at the end of ten days the egg proved unfertile.

‘On June 15th, 1917, the hen laid another egg in a nest placed in a young fir-tree; but this was situated in a corner of the aviary nearest the path, and the constant passing of visitors disturbed the birds, who abandoned the nest after a few days ...

‘To avoid such another failure, I put the pigeons in a large aviary (6m x 4m) planted with thick bushes, in which I placed several nests. In the early days of August an egg was again laid in a very small basket, placed higher than all the others, in a witch-elm.

‘This nest was left alone for fear of disturbing the birds ... and towards August 25th, it was seen that it contained a young one a few days old, rather similar to those of many granivorous doves. By September 12th it was completely covered with feathers and able to fly. ... The parents fed it on their own customary diet - crushed potatoes, hemp-seed, and boiled rice, with sweetened milk and bananas. The latter fruit was unobtainable from September 10th, and was replaced by pears. ... Some authors declare that the “Pigeon Hollandais” lays two eggs per clutch. This may be the case in their own country (Seychelles Islands), but it is to be remarked that in this case these birds each time produced only one egg ...’

(Breeding of the New Pigeon Hollandais *Alectroenas pulcherrima*. March, 1918. (Series III) Vol. IX, 157 - 159.)

‘... on account of the length of the war, I parted with a good many of my birds, keeping only a few rare birds and pets, about four hundred.

‘After the war I intend to move my collection into a warmer country than Northern France ... My three pairs of Buffon's Touracos laid, and hatched several young ones, but did not rear any. Very bad luck! Two of the hens were bred at Villers-Bretonneux. I hope I shall be more successful this year.

‘During the last year I again received some good birds; a fine cock Crested Guinea Fowl *Guttera cristata*; a cock Stone Curassow

Pauxi galeata and a cock Sclater's Curassow *Crax sclateri*; some parrots *Tanygnathus luconensis*, *Pionus violaceus* and *corallinus*, and a lovely Parrakeet *Palaeornis schisticeps*; a great Gaboon Hornbill *Buceros atratus* and a lot of Toucans - mainly *Rhamphastos ariel*, and *Andigena bailloni*.

'In the spring I got a very fine Giant Touraco *Corythaeola cristata*, but alas! he has long been dead ... My Sunbirds grow very old ... It is always possible in France to get all kinds of comon birds from Africa and America, but they are much more expensive than before the war. It is now impossible to find Australian and Asiatic birds.'

(Notes from the aviaries at Villers-Bretonneux. April, 1918. (Series III) Vol. IX, 201.)

The letter from which the above was extracted is dated January 23rd, 1918. In April of that year, the Germans broke through the Western Front. Dr. Graham Renshaw (1918), then Editor of the *Avicultural Magazine*, announced: 'By a misfortune without paralled in the history of aviculture, Lieut. Delacour's collection at Villers-Bretonneux has been utterly destroyed.' Dr. Renshaw continued with a list of 360 birds of 141 species, subspecies and mutations, which died there; every specimen in the collection.

'My duties with the British Army having summoned me into the part of Germany occupied by the Allies, I was able to visit the Cologne Zoological Gardens on December 23rd last.

'Having many a time heard during the course of the war that the starving Germans had been compelled to sacrifice their animals, I supposed that I should see only empty cages. What was my astonishment to still find there a very fine series of animals, and a collection, all things considered, better, indeed, than that in Paris or even London!

'The Bird House is very well appointed: one finds cages all round. The centre is occupied by aquaria and vivaria. The collection of Parrakeets there is remarkable ... amongst others, Lear's Macaw and the Gang-gang Cockatoo *C. galeatus*, and a fine pair of *Polythorynchus stellatus* [one of the *Calyptorhynchus*?]. The Amazons, *Pionus*, etc. are well represented *A. diademata*, *bodini*, *P. menstruus*, etc. There ... is a good pair of *Cyanolyseus patagonicus* and a charming *Brontogeris pyrrhopterus*. Further on I note a little Heron with a most curious beak, enormous beak (*Canchroma cochlearia*); a *Dacelo gigantea*, a Toco Toucan, several Hornbills, a Nicobar Pigeon, a Giant Whydah, Chinese Blue Magpies, and a number of small and medium-sized birds. Further

on I observe a couple of *Goura coronata* and a couple of the rare Sclater's *Goura Pigeon*, and some White Sacred Ibises.

'In the centre of the house one sees a *Python molurus* and a Reticulated Python, a certain number of Crocodiles, Alligators, and Caimans; Lizards, Tortoises, Bull Frogs; Butterflies and other insects. In the aquaria one finds various Chancitos, some Heimchromids, Chromids, etc., and young Sturgeons.

'... there were at least fifty Rosy Flamingoes, and three Red Flamingoes from Mexico which appeared to have been newly imported ... The collection of raptors is very fine; almost all the larger species figure in it - Eagles, Vultures, Condors, Ospreys. I call attention to a Harpy Eagle, a Bengal Vulture, and a King Vulture ... The big birds [include] ... a Bennett Cassowary, a Westermann Cassowary, ... and ... a couple of the rare Monk Crane.

'... To sum up, the Zoological Garden of Cologne has scarcely suffered at all from the war, and it is likely that it is the same with other German Gardens.

'It is not without bitterness that I have compared it with the mournful ruins, the heaps of rubbish, the smashed trees, the twisted iron-work and broken glass which represent today my poor garden ... which was still flourishing less than a year ago ...'

(The Cologne Zoological Gardens after the Armistice. March, 1919. (Series III) Vol. X, 86 - 88.)

'Dear Dr. Renshaw, - I am glad to tell you that I have got a new country seat in Normandy, the Château de Clères (Seine-Inférieure) between Rouen and Dieppe.

'I shall attempt immediately to build aviaries and arrange the park for birds. There is running water and a lake of about three acres, quite convenient for Waders and Waterfowl. I hope to have ready for next spring a bird gallery, two bird-rooms, twenty aviaries with heated shelters and twenty enclosures, as well as larger paddocks for Ostriches, Rheas, Cassowaries and Cranes.

'I think it will be a good beginning, and hope to improve it later on. I cannot possibly pretend to keep at once the same number of birds as I used to do ..., owing to the awful prices one has to pay for every thing nowadays.

'Clères is only 25 miles from Dieppe; I hope that it will be convenient for British aviculturists to stop there on their way to the Continent.

Yours very sincerely, Delacour.'

(M. Delacour's new Estate. December, 1919. (Series III) Vol. X, 256.)

REFERENCES

- DELACOUR, J.T. (1925) Touracos. *Avicultural Magazine*, (Series IV) 4: 284 -290.
- GIBBARD, A. (1988) Jean Delacour's contributions to the *Avicultural Magazine*, 1916 - 1982. *Ibid.* 94: 70 - 81.
- JOHNSTONE, MRS. E.J. (1904) The nesting of Fraser's Touracou *Ibid.* (Series II) 3: 26 - 29.
- LINDHOLM, J. (1987) Touraco Propagation in public zoos (The IZY breeding records; 1959 - 1981), *The Honeycreeper* [International Softbill Society] 2 (No.1): 15 - 22.
- (1988) Jean Delacour and the *Avicultural Magazine*. *Avicultural Magazine*. 94: 68 - 69.
- PICHOT, P.A. (1916). Stick Insects *Carausius morosus*. *Ibid.* (Series III) 8: 94 - 95.
- RENSHAW, G. (1918) Ave Atque Vale: Villers-Bretonneux. *Ibid.* (Series III) 9: 305 - 307.
- RUTGERS, A. & NORRIS, K.A. (1972) *Encyclopedia of Aviculture* (Vol.2), Blandford Press Ltd. Poole, Dorset.

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* * *

BREEDING AND BEHAVIOUR OF THE BLUE PARROT-FINCH

By Lawrence Kuah (Singapore)

The Blue or Tri-coloured Parrot-finch *Erythrura tricolor* is one of many species of parrot-finches which inhabit the South-east Asia and Pacific regions. However, the Blue is found only on Timor in the Lesser Sunda group, and surrounding islands further east. It must not be confused with the more widely distributed Blue-faced Parrot-finch *E. trichroa*, a species with an entirely different colour scheme and which appears in many collections.

These little gems are approximately 80 - 100 mm long, with black bills. They are sexually dimorphic and the males have the sides of the head and forehead a deep cyan blue with the colour a lighter shade on the breast and continuing onto the belly. There is a blue stripe over the median wing coverts, although this is not consistent in all specimens. Wings and back are rich emerald green, with red on the rump and short tail. This is in contrast to the Blue-faced Parrot-finch, which has a pointed tail, in common with the Pin-tailed Parrot-finch or Nonpareil *E. prasina*. The female is essentially the same except that the blue is not as intense and can be said to be a soft pastel shade of powder blue. The legs and feet are a dull straw-peach colour.

On the western side of Timor Island, slightly further inland from the Indonesian town of Kupang where they were collected, the species is rare and birds were more often heard than actually sighted. Among sightings there have been many instances of confusion with the Five-coloured Nun or Munia *Lonchura quincolor*, which also occurs in the same locality. Occasionally parties of three to eight birds can be seen flying across small clearings to roost. They are found at a higher altitude in bush thickets, bamboo and ravine forest.

Perhaps due to their shy nature and rarity, it was difficult to obtain many birds and according to my personal observations their breeding season in the wild would be from May - July, as most juvenile birds are sighted within this period.

In aviculture they are definite rarities in collections and the numbers exported to Europe and the United States are very few and far between. To my knowledge, they are among the most expensive of the *Erythrura* parrot-finches. Fortunately, the species is repre-

sented in good numbers in my collection and recently a group consisting of 15.12 Blue Parrot-finches was selected from the total numbers held in stock and an attempt was made to establish them in a large aviary in the hope of achieving better breeding results.

Previously, when individual pairs of these birds were housed in typical finch cages measuring 36 in x 24 in x 18 in high (91 cm. x 61 cm. x 46 cm.), they produced no positive breeding results. Indeed, when they were removed for a closer examination the reason quickly became clear. Blue Parrot-finches are extremely prone to obesity and birds kept in smaller cages, which reduced opportunities for exercise, would appear a little too robust-looking and the fatty tissue could be seen as yellow 'chunks' around the neck/crop region, thighs and intestinal surface. Such birds are unhealthy, despite external appearances, and the chances of breeding from them are virtually nil.

Apart from the total of 27 birds kept for the breeding aviary, the remainder were too fat to be placed in similar accommodation as an unrestricted expanse of space would have imposed additional shock and stress on their systems, ultimately leading to their demise; this could probably be attributed to heavy damage from excess fat accumulation. Instead, they were relocated to alternative accommodation in indoor lorikeet aviaries where they could get more exercise in order to slim down gradually.

The breeding aviary was a peculiar 'L' shaped structure, 27 ft. x 18 ft. x 8 ft. high (8.6 m. x 5.7 m. x 2.5 m.), at an adjoining corner of two separate blocks. Immediate neighbours were pairs of Rothschild's Mynahs *Leucopsar rothschildi* at one end and a menacing-looking adult pair of Helmeted Hornbills *Rhinoplax vigil*, at the other. Surprisingly, these extremely timid finches appeared undisturbed by the hornbills and would even perch on the natural branches of a local Asian shrub, *Wrightia religiosa*, growing right next to their common partition!

Due to space constraints, these large hornbills were left in the adjoining block aviary, which was of similar proportions, and throughout the entire period, up to the present time, had not caused any great distress to the finches.

The 'L' shaped aviary is heavily planted with shrubs - *Hibiscus* spp. and has fern slabs of local orchids *Gramatophyllum slapeliiiflorum* on the central corner. There is a small clearing in the middle, facing the protruding 'L' section.

Other occupants of this aviary included 1.1.3 Cinnamon Ground Doves *Gallicolumba rufigula*, 1.2 Thick-billed Ground Doves *Trugon*

terrestris, 3.3 Iris Lorikeets *Trichoglossus iris* 1.1 Mountain Peacock-pheasants *Polyplectron inopinatum* (which bred at about the same time as the fledged chicks of the Blue Parrot-finches left the nest), a number of young Red and Blue Lories *Eos histrio* which were bred the previous year and placed in the aviary prior to the introduction of the Blue Parrot-finches.

Due to their inquisitive and somewhat mischievous nature, typical of hand-raised lories, all birds of the latter species were removed as fears arose that they might molest and disrupt the nesting activities of the Blue Parrot-finches.

A total of eight nest boxes were situated at different points in the aviary. Wicker finch baskets were not used as the type currently in use was unsuitable with too large an entrance hole. The boxes used were standard, horizontal nest boxes 14 in. x 5½ in. x 3 in. high (35.5 cm. x 16 cm. x 7.5 cm.), with a 1½ in. (3.7 cm) square entrance hole, and mass-produced for use with all *Opopsitta* fig parrots, *Charmosyna* and *Oreopsittacus* lorikeets and smaller members of the genus *Trichoglossus* in my collection.

Two of these were nestled among the slabs of orchid plants and mostly hidden by the leaves, although the opening of one was visible and could be observed from the exterior. The others were tucked at various corners, with the ends facing each other, and these were used regularly by Iris Lorikeets which were very prolific and produced chicks every season.

There were three separate feeding posts, two located on the ground and one at about chest-level - for the exclusive use of the lorikeets - consisting of a cup containing nectar and a small dish of diced fruit. The diet provided for the Blue Parrot-finches is as follows: one part each of panicum, Japanese, white and red millets, a half part of plain canary seed and four parts of paddy (unhusked rice), together with home-grown grass, wild millet and rice sprays, which are hung according to availability.

A standard poultry crumble, with unpolished rice, cracked maize, pulses and beans is provided for the doves and peacock-pheasants, together with chopped vegetables and ground meat ad-lib.

Water is available at two different locations - a trough on the ground and a large cup for bathing on the same level as the lorikeet feeding post. Fresh water is given twice daily. Vitamins, in the form of NEKTON T (Nekton Productke - Germany) are added to the water once a week.

Since the Blue Parrot-finches had no restriction to any of the

feeding stations, they were free to choose whatever they desired. Visual observations revealed that, apart from their seeds, they would sample chicken crumble and beans, especially the sprouts that appeared from the sides of the water trough, but never touched meat or the lorikeets' nectar.

Courtship behaviour was observed, with loud twitterings, a distinctive monosyllabic 'tweet', not infrequently heard in the field. Apart from these vocalisations, males have been seen and heard giving a soft, warbling vocalisation, almost inaudible to the ear, while much chest pouting was observed together with typical sparrow-like copulation.

All this time some birds would gather chaff, left-over from old seed sprays, and frequent the box hidden by orchids. Filling the box with leaves, chaff and feathers, birds were also observed to tear orchid leaves into small strips to construct an untidy nest. Strangely enough, more than one pair of birds was observed building the nest.

At night, it was noted that the remainder of the boxes were utilised for roosting, with a small number of birds, presumably unpaired, preferring to roost out in the open.

A thorough check revealed that only one box was in use and the other boxes, although laced with finch droppings, were empty, and the conclusion was reached that these could not contain any breeding pairs. Throughout this time, active nesting activities continued and two females were observed to use the box for long periods.

As the orchid plants had now grown completely over the box, it became impossible to open the observation hatch/door to check on the occurrences of eggs or chicks. The nest was thus left unmolested.

Approximately 12 - 14 days after it was first suspected that eggs had been laid, the females were observed actively foraging for food and on occasions males would be seen feeding the females by regurgitation. Due to the thick planting it was difficult to observe everything clearly, but it was obvious the finches were feeding chicks as they started to take an interest in insects and would remove some of the ant larvae put out for the Mountain Peacock-pheasant chicks that had also hatched at this time. These peacock-pheasants are another prized possession and their successful breeding was very encouraging indeed, as their first clutch of two eggs was removed for artificial incubation and rearing and the clutch was doubled, the birds replacing the eggs that had been removed within two weeks.

It was to my very great surprise that after 20 days or so, three drab-looking Blue Parrot-finch chicks appeared, with an adult female, sitting in the peacock-pheasants' feeding bowl. They still had some down adhering to the region of their crown, had no trace of blue on them and had dull brown-red rumps and tails. They looked, at this stage, exactly like juvenile Bamboo or Tawny-breasted Parrot-finches *E. hyperythra*.

They were most endearing to observe, begging for food from a single female which picked up scraps of ant larvae to feed them directly. On one occasion, the two peacock-pheasant chicks, by now almost three weeks old, were observed feeding side-by-side with these tiny parrot-finch chicks, together with an anxious female peacock-pheasant which was more nervous and called her two chicks under her tail at the slightest disturbance.

Later on, I observed the female parrot-finch feeding regurgitated seed to the three chicks which always returned to their box at night to roost. Although there were many other adult Blue Parrot-finches around and about these three juveniles, no aggression occurred and at the present time (mid-August, 1993) the youngsters are three-and-a-half months old and independent of their mother.

Blue Parrot-finches have always been rare in captivity, and together with other *Erythrura* parrot-finches, are ever popular with aviculturists and specialist finch fanciers throughout the world. Ironically, however, very few papers, have been presented about parrot-finches in general, despite the large numbers in the hands of aviculturists - the most common being the Pintailed or Nonpareil and the Bamboo or Tawny-breasted Parrot-finches, endemic to the south-east Asia region.

Perhaps others would write about their experiences and successes with this beautiful and interesting genus in the near future. Efforts should also be made by responsible aviculturists to breed from whatever stock they have in order to preserve these species in aviculture, and they would apply equally to the more difficult to breed species.

Because of increasing negative pressures on the live bird trade, demonstrated by the refusal to carry wild-caught birds by most international airlines, regardless of the quality or non-endangered status of the species concerned, it is even more important nowadays to conserve and preserve stocks presently held by aviculturists.

BREEDING THE WHITE-HEADED (BÖHM'S) BUFFALO WEAVER AND THE TAVETA GOLDEN WEAVER AT CHESTER ZOO

By Roger Wilkinson and Wayne McLeod

The breeding of White-headed Buffalo Weavers *Dinemellia dinemelli* and of Golden Palm Weavers *Ploceus bojeri* at Chester Zoo in 1989 was briefly reported in an earlier article in the Avicultural Magazine (Wilkinson, 1990). A further account of these breedings was requested and in researching the scientific literature for the present article it became apparent that the Ploceid weavers obtained from two different sources as Golden Palm Weavers *Ploceus bojeri* in 1988 did not fit the written descriptions of that species. The birds have now been identified as Taveta Golden Weavers *Ploceus castaneiceps*. Close examination of the males shows that, instead of having the uniformly orange head of Golden Palm Weavers, they all have yellow faces with chestnut-orange colour on the nape connecting with a similarly coloured bib on the upper chest. The females are also streakier than described for the Golden Palm Weaver which supports their re-identification as Taveta Golden Weavers (Hall and Moreau, 1970; Mackworth-Praed and Grant, 1980; Williams and Arlott, 1980) and which was confirmed by reference to skins at the Liverpool Museum.

This account is limited in detail by the fact that observations of both species were restricted by their choosing to breed in inaccessible areas in the free-flight of our Tropical House. The Tropical House is a large, high, barn-sized building 240 feet long x 200 feet wide and 40 feet high, which includes several water areas and waterfalls and is thickly planted with palms, bananas, figs and many other tropical plants and flowers. It is heated throughout the year. Artificial lighting is provided only to a series of aviaries on an elevated gallery on one side of the house and to the reptile areas on the opposite lower floor. When opened in 1964 this was the largest indoor tropical house in the country and although now showing its age it is still one of our favourite areas of the Zoo. Around 30 species of birds are housed in the free flight area of this house including Touracos (previously Schalow's Touraco *Tauraco schalowi*, presently White-cheeked Touraco *Tauraco leucotis*), Celebes Quail Doves *Gallicolumba tristigmata*, Pink-necked Green Pigeons *Treron vernans*, Red-backed Mousebirds *Colius castano-*

tus and various softbills including Fairy Bluebirds *Irena puella*, White-rumped Shamas *Copsychus malabaricus*, various Tanagers and a number of species of African Starlings.

With such a variety of birds a large variety of food is offered and both the Taveta Golden Weavers and the White-headed Buffalo Weavers take mixed seed and fruit as well as live food. Mixed seed includes white millet, canary mixture and wheat - the latter being taken by the larger Buffalo Weaver. The fruit eaten includes banana, grape, apple and orange. The Taveta Golden Weavers are particularly fond of feeding from halved oranges. When feeding young, live food was essential for both species which accepted locusts, morio worms, mealworms and waxmoth larvae.

White-headed Buffalo Weavers *Dinemellia dinemelli* were obtained in 1988 from two sources; four unsexed birds in July and a further six birds including two sexed pairs in August. These birds occur in the wild in eastern Africa from Sudan north to Tanzania and probably arrived in shipments then being sent to the U.K. from Tanzania. White-headed Buffalo Weavers are striking birds, essentially white with black back, mantle, wings and loreal face patch and orange rump, upper and under tail coverts. When displaying they raise their wings to display large white patches and in flight the orange rump is most conspicuous. The black rather than dusty brown back, mantle and wings and lack of white edging to the scapulars indicate that these birds belong to the race *Dinemellia dinemelli boehmi* sometimes referred to as Böhm's Buffalo Weaver (Rutgers and Norris 1977). This fits with their reported origin as this is the race occurring in Tanzania which was again confirmed by comparison with museum specimens.

The White-headed Buffalo Weavers are very sociable and extremely active as they perform wing-raising displays whilst vocalising as they approach one another. A large nest was built in the crown of a tall palm - too high to be inspected. This was largely built of lengths of fresh or dry vegetation, especially (much to the distress of the zoo gardeners) the thorny green fronds of *Asparagus* fern *Asparagus sprengeri* and *Asparagus setaceus plumosus*. The preference for these thorny fronds is not unexpected since in the wild their untidy nests are built from thorny twigs (Mackworth-Praed and Grant 1980). The communal nest structure measured several feet across and included three separate nest chambers. Unfortunately, the White-headed Buffalo Weavers were not all individually colour-marked and it was not possible to ascertain which individuals were building and which were entering the next chambers.

Several nesting attempts were made before the first chick fledged on 20 October 1989. The fledgling closely resembled the adults differing only in having darker eyes and a generally duller paler orange colouring where the adults are reddish orange. A chick that hatched in early May 1990 did not survive but another which hatched in October 1990 fledged successfully. The birds again nested throughout the spring/summer 1991, with chicks being hatched in April, June, July and August. At least three different birds were seen queuing near the nest with live food, indicating that co-operative breeding may be a feature of the social organisation of these Buffalo Weavers. An extended breeding season has been previously recorded in the wild with nesting from November to March. However, at Chester survival has been poor with most being lost before or shortly after fledging.

Two pairs of Pied Imperial Pigeons *Ducula bicolor* kept in the Tropical House began nest building activities in winter 1991/spring 1992. These steal material from the White-headed Buffalo Weaver nest and no full nest structure has been built by these weavers since this plundering began. The Pied Imperial Pigeons have so far thwarted our attempts to catch them up for transfer to another enclosure.

Taveta Golden Weavers *Ploceus castaneiceps* were obtained at the same time from the same sources as the White-headed Buffalo Weavers and also originate from East Africa. The males are especially attractive being a bright golden yellow, duller on their backs, but with a brighter chestnut-orange collar on the nape and necklace on the upper chest. Unlike many other ploceine weavers the males have no non-breeding dress and are perennially in full colour. In contrast the females are rather dull streaky brownish above and yellowish below. The bills of the females are horn-coloured with a darker upper mandible whereas those of the males are all black. Previously little known in aviculture, the Taveta Golden Weaver is not mentioned by Restall (1975) nor Rutgers and Norris (1977) although both have individual entries for the sympatric Golden Palm Weaver *Ploceus bojeri* and the similar Golden Weaver *Ploceus subaureus*.

Four pairs of Taveta Golden Weavers were obtained in July 1988, a further pair in August and a single male in October. Only the males build nests often in inaccessible positions at the ends of Palm fronds, especially those overhanging water areas. Other nests were built in Rubber Trees *Ficus elastica* and Weeping Fig *Ficus benjamina*, and low down in Umbrella Bog plants *Cyperus*

alternifolius by the side of one of the water areas. Their preference for strips of fresh green material which they tear off from the leaves of living palms again caused some consternation amongst the gardeners especially as so many nests were started only to be deserted before completion or rejected by the fussy females. The first chick was fledged on 31 July 1989 only to drown in the water below its nest. A later chick which fledged on 13 October survived without falling into the water. Two chicks fledged from a different nest in November, although one of these also fell directly into the water below the nest and was found drowned. This appears strange for a species which elected to nest in palms above water. However this is not their normal habit. In the wild *Taveta* Golden Weavers build exclusively in swampy vegetation, usually bullrushes, rather than the palms or bushes used by the ecologically segregated but sympatric Golden Palm Weaver (Hall and Moreau 1970). Clearly this preference is not inflexible as shown by the birds at Chester Zoo nesting in palms and other trees as well as in lower vegetation. Two more chicks fledged successfully in December 1989. The chicks resembled the female but were generally darker and more streaky, altogether more sparrow-like, and had darker bills. Only the breeding female was seen to carry live food to the nest or to feed the fledged chicks. The birds bred again in 1990 with a chick successfully fledged in March, and two more hatched in May (another of which found its way directly into the water). At that time the colony consisted of six males and only one female. Since the loss of that female in 1991 no further breeding has been possible. Five males continue to weave nests suspending these from the palm fronds in the false hope of attracting a female. The observed seasonal scatter of nesting activity with no obviously defined breeding season may perhaps be expected from a species in which, unusually for ploceid weavers, the males have no non-breeding dress. Mackworth-Praed and Grant (1980) give no breeding dates for the *Taveta* Golden Weaver commenting that notes are not reliable because of past confusion with similar species. However, Brown and Britton (1980) report nesting activity in the wild from October to May.

As reported above the White-headed Buffalo Weaver *Dinemellia dinemelli boehmi* and the *Taveta* Golden Weaver *Ploceus castaneiceps* were first bred at Chester Zoo in 1989. These are both believed to be first breeding successes. Anyone knowing of previous breedings in Great Britain is asked to contact the Honorary Secretary.

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REFERENCES

- BROWN, L.K. and BRITTON, P.L. (1980) *The Breeding Seasons of East African Birds*. Nairobi: East African Natural History Society.
- HALL, B.P. and MOREAU, R. E. (1970) *An Atlas of Speciation in African Passerine Birds*. London: British Museum (Natural History).
- MACKWORTH-PRAED, C.W. and GRANT, C.H.B. (1980) *African Handbook of Birds Series One. Birds of Eastern and North Eastern Africa* Vol. II **2nd edn**. London and New York: Longman.
- RESTALL, R.L. (1975) *Finches and other seed-eating birds*. London: Faber and Faber.
- RUTGERS, A. and NORRIS, K.A. (1977) *Encyclopedia of Aviculture*, Vol. 3. Dorset: Blandford Press.
- WILKINSON, R., (1990) Chester Zoo 1987 - 1989: Some observations on bird-rearing and arrivals to the collection. *Avicultural Magazine* **96**: 63 - 75.
- WILLIAMS, J.G.E. and ARLOTT, N. (1980). *A Field Guide to the Birds of East Africa*. London: Collins.

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ANALYSIS OF THE RELATIONSHIP BETWEEN EGG ORDER (1 - 15) AND EGG QUALITY AS DETERMINED BY HATCHING AND FLEDGING RATES IN SIBERIAN, FLORIDA SANDHILL, WHITE-NAPED AND RED-CROWNED CRANES.

By Michelle C. Hunt (Aviculture Intern, International Crane Foundation, Baraboo, Wisconsin, USA)

ABSTRACT:

The fertile eggs of four species of Cranes currently or formerly at the International Crane Foundation (Siberian, Florida Sandhill, White-naped and Red-crowned) were studied to learn about the relationship between egg order and egg quality. The sample included 294 eggs. Indices of egg quality included the hatching rate, the fledging rate, and the hatching x fledging rate for each egg. Eggs that were not incubated full-term were not used in the analysis of hatching or fledging rates and chicks that were euthanised due to factors not indicative of egg quality were not used in the analysis of fledging rates. A significant negative relation was found between egg order and the fledging rate. Hatching rates and hatching x fledging rates (a measure of overall egg quality) were not significantly related with egg order. Therefore, inducing cranes to lay supernumerary eggs does not appear to result in reduced reproductive potential as the number of eggs laid in a year increases.

INTRODUCTION

Breeding large numbers of endangered animals is frequently desirable in captive breeding programmes. Zoos have increased the productivity of captive cranes by removing the eggs, termed "multiple clutching" (Koga 1961). Although the effects of multiple clutching on egg size have been studied (Putnam and Russman unpublished), no study has examined the effects of this technique on egg quality of cranes. If multiple clutching results in diminishing returns of fledged chicks per egg laid as the number of eggs laid in the season increases, then inducing females to lay eggs past a certain point may not be advisable. However, this possible reduction in fledged chicks should be weighed against the potential lifetime total of chicks for each female. If a female produces an overall high number of chicks, this is good for conservation. I examined the effects of multiple clutching on egg quality as

measured by hatching rates, fledging rates, and hatching x fledging rates.

METHODS

Egg data were taken from the following individuals of four species of captive cranes at the International Crane Foundation: 3 Siberian *Grus leucogeranus*, 5 Florida Sandhill *Grus canadensis pratensis*, 4 White-naped *Grus vipio*, and 2 Red-crowned *Grus japonensis*. Egg data from 1979 to 1992 were collected. All fertile eggs were included in the hatching analysis except those eggs we chose not to hatch for management reasons or those eggs that were sent away. Eggs that are sent to other programmes are sometimes subjected to conditions that affect the hatching rate. In addition, chicks that are euthanised for reasons not relating to the quality of the egg were not included in fledging data. Statistical analyses including Pearson's product-moment correlation matrix (Pearson), ANOVA, and linear regression were performed on egg order vs. hatch rate, egg order vs. fledge rate, and egg order vs hatch x fledge rate. Hatch rate is percentage of eggs hatched. Fledge rate is percentage of chicks fledged. Hatch x fledge rate is a simple product of the two and is an overall indicator of egg quality. Systat version 5.03 was used for all statistical analyses.

RESULTS

The mean hatch rate, fledge rate and hatch x fledge rate for each egg sequence (1 - 15) was calculated, and the results can be found in Table 1. Regression lines for these relationships are shown in Figures 1, 2 and 3 respectively.

Hatch Rate

Hatch rate was not significantly related to egg order in the Pearson test ($p=.762$), linear regression ($p=.762$) or the ANOVA ($p=.801$).

Fledge Rate

Fledge rate was significantly related to egg order for the Pearson test; results are as follows: $r=-.170$, $N=178$, $p=.023$. (See Table 2) Fledge rate was also significantly related to egg order with the linear regression analysis. The regression equation was $\text{fledge ratio}=0.938-0.021E$, where E is egg order (Figure 2); $N=178$, $p=.023$. (See Table 3). Fledge rate was not significantly related to egg order in the ANOVA ($p=.363$).

Hatch x Fledge Rate

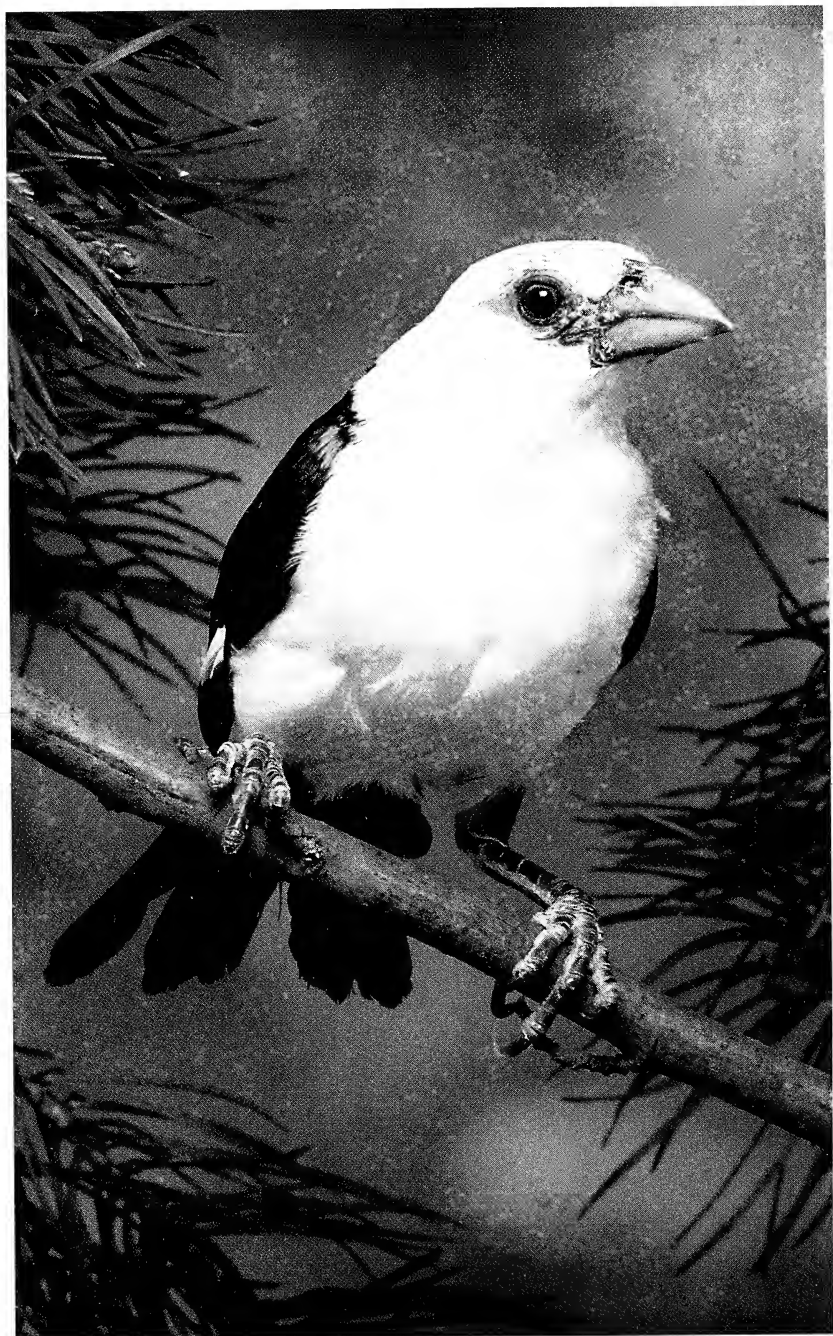
Hatch x fledge rate was not significantly related in the Pearson test ($p=.326$), linear regression ($p=.326$) or the ANOVA ($p=.398$).



Capuchinbird age 22 days



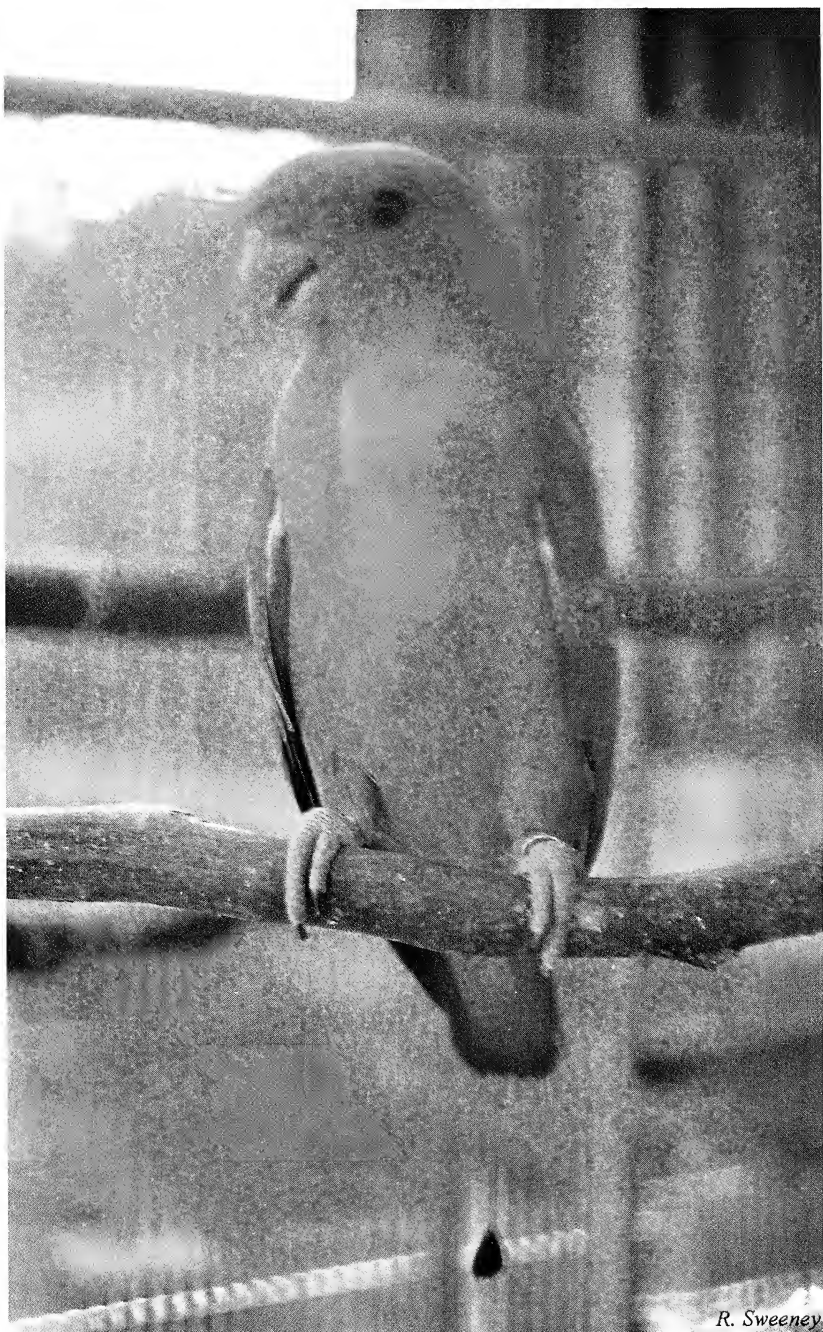
Capuchinbird age 28 days
see page 3



White-headed Buffalo Weaver
see page 24



Emerald Starling
see page 35



Blue-crowned Racket-tailed Parrot
see page 40

DISCUSSION:

In multiple clutching, the order in which eggs are laid may have a variety of effects on egg characteristics. Research has been completed which examines the relationship between egg order and the sex of Canada Geese *Branta canadensis* (LeBlanc 1987b). No correlation was found. In another study, LeBlanc (1987a) determined that egg order had no short-term implications for the fitness of the chick produced as measured by hatching and fledging success. Research on the Black Brant *Branta bernicla nigricans* suggests that egg size decreases with position in the laying sequence (Flint and Sedinger 1992). Friedl (1993) reviewed the literature on intraclutch egg-mass variation in geese (the last egg is usually the lightest one in the clutch) and its influence on brood reduction in precocial birds, a possibly adaptive parental strategy. Ankney (1982) found that in 4 - egg clutches of Lesser Snow Geese *Anser c. caerulescens* the first 2 eggs laid produced mostly males (64%) and the last 2 produced mostly females (72%). Putnam and Russman (unpublished) discuss potential consequences of multiple-clutching in captive Cranes. Some possible deleterious consequences cited are: increased intervals between successive eggs in a season (9% of birds studied), seasonal decline in egg weight (21% of birds), stretching of the oviduct (1 bird), and later initiation of laying (1 bird). Despite the effects of multiple-clutching noted, such as the decrease in egg weight, my study lends credence to the theory that multiple-clutching does not adversely affect egg quality. Later eggs are sufficiently valuable; multiple-clutching in order to produce an optimum amount of chicks appears to be justifiable. In conclusion, egg order is an entity with diverse ramifications in breeding biology; it is important in terms of further comprehension of wild species and in its ramifications upon captive breeding of endangered avian species.

Literature cited

- ANKNEY, C. DAVISON 1982. "Sex Ratio Varies with Egg Sequence in Lesser Snow Geese." *The Auk* **99** (4) 662-666.
- FLINT, PAUL L. and SEDINGER, JAMES S. 1992. "Reproductive Implication of Egg-Size Variation in the Black Brant." *The Auk* **109** (4): 896-903.
- FRIEDL, THOMAS W.P. 1993. "Intraclutch Egg-Mass Variation in Geese: A Mechanism for Brood Reduction in Precocial Birds?" *The Auk* **110** (1): 129-132.
- KOGA, T. 1961. "Studies on the reproduction of Cranes, Especially on Their Artificial Incubation and Breeding." Reprinted from *Journal of Japanese Association of Zoological Gardens and Aquariums* **3** (3): 51---68.

LEBLANC, YVES 1987a. "Egg Mass, Position in the Laying Sequence, and Brood Size in Relation to Canada Goose Reproductive Success." *The Wilson Bulletin* **99**(4): 663-672.

1987b. "Relationships Between Sex of Gosling and Position in the Laying Sequence, Egg Mass, Hatchling Size, and Fledging Size." *The Auk* **104**: (1) 73-76.

PUTMAN, MICHAEL, S., and RUSSMAN, SHIRLEY E., unpublished. "Changes in Egg Characteristics and laying Intervals in Captive Cranes laying Multiple-clutches."

Table 1

Egg sequence vs. mean hatching, fledging rate and hatching x fledging rate.

Egg Sequence	N Fertile	Hatch Rate	N	Fledge Rate	N	Hatch x Fledge Rate
1	44	.614 +/- .493	26*	.923 +/- .272	43*	.558 +/- .502
2	40	.650 +/- .483	22	.955 +/- .213	36	.583 +/- .500
3	46	.739 +/- .444	31	.871 +/- .341	43	.628 +/- .489
4	41	.634 +/- .488	24	.833 +/- .381	39	.513 +/- .506
5	34	.618 +/- .493	19	.842 +/- .375	32	.500 +/- .508
6	31	.677 +/- .475	20	.750 +/- .444	30	.500 +/- .509
7	19	.474 +/- .513	9	.667 +/- .500	19	.316 +/- .478
8	9	.667 +/- .500	6	.833 +/- .400	9	.556 +/- .527
9	7	.857 +/- .378	6	1.00 +/- 0.00	7	.857 +/- .378
10	8	.750 +/- .463	6	.667 +/- .516	8	.500 +/- .535
11	7	.714 +/- .488	4	.500 +/- .577	6	.333 +/- .516
12	5	.400 +/- .548	2	.500 +/- .701	5	.200 +/- .447
13	1	1.00 +/- 0.00	1	1.00 +/- 0.00	1	1.00 +/- 0.00
14	1	1.00 +/- 0.00	1	1.00 +/- 0.00	1	1.00 +/- 0.00
15	1	1.00 +/- 0.00	1	1.00 +/- 0.00	1	1.00 +/- 0.00

*N hatch for fledging and hatching x fledging rates are lower than for hatching rates.
See methods for an explanation.

Table 1a

MEAN HATCH RATE, FLEDGE RATE, AND HATCH X FLEDGE RATE

	Hatch Rate	Fledge Rate	Hatch x Fledge Rate
N	294	178	280
Mean	.653	.843	.536
ISD	+/- .477	+/- .365	+/- .500

Table 2
PEARSON CORRELATION

	Egg Sequence/r	N	P
Hatch Ratio	.018	294	.762
Fledge Ratio	-.170	178	.023
Hatch x Fledge Ratio	-.059	280	.326

Table 3
LINEAR REGRESSION ANALYSIS

	Egg Sequence/ Linear Regression Coefficient/Slope	N	T (2-tail)	P
Hatch Ratio	.003	294	.303	.762
Fledge Ratio	-.021	178	-2.292	.023
Hatch x Fledge Ratio	-.010	280	-.984	.326

Figure 1
Hatching Rate VS. Egg Sequence
Linear Regression with 95% Confidence Interval

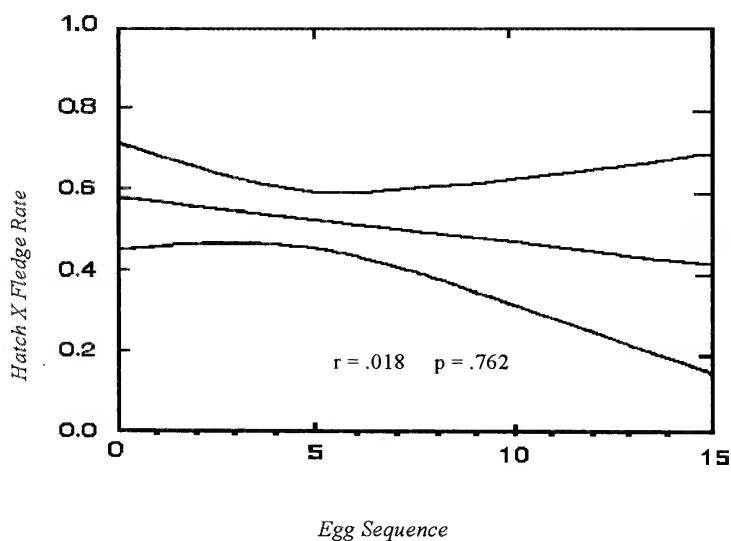


Figure 2
Fledging Rate VS Egg Sequence
Linear Regression with 95% Confidence Interval

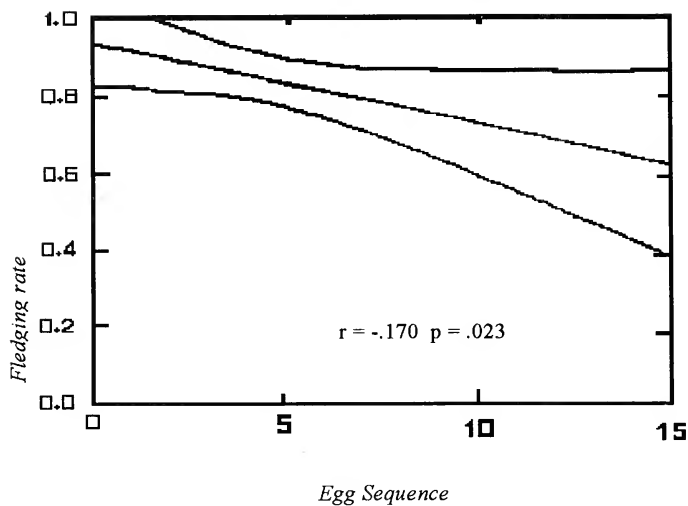
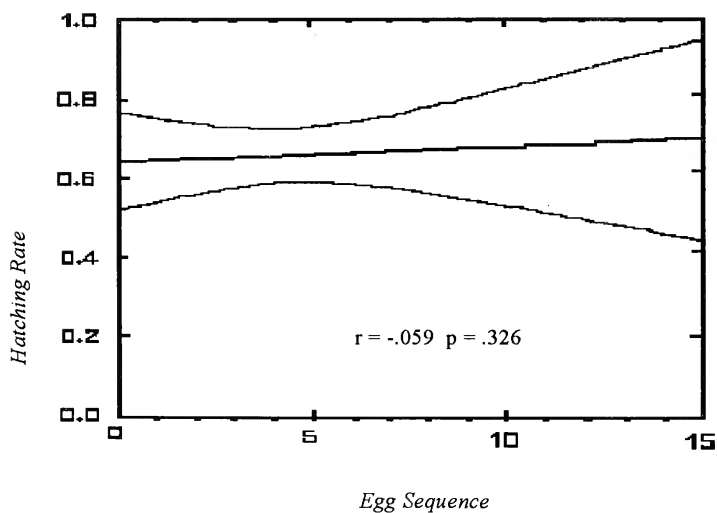


Figure 3
Hatching X Fledging Rate VS. Egg Sequence
Linear Regression with 95% Confidence Interval



* * *

BREEDING THE EMERALD STARLING

By Stewart Pyper (Frome, Somerset)

The Emerald Starling *Coccycolius iris* is found in West Africa from Guinea to the Ivory Coast. It is, without doubt, an extremely beautiful bird with its eye-catching iridescent plumage and viewed in sunlight it appears a very different bird to the one seen on a damp or wet day. Colour plates of the species can be found in Mackworth-Praed and Grant, Bannerman and the *Avicultural Magazine*. One of the best photographs of the species appears on page 91 of Walsrode Park's guide book.

This is a small, bright green starling. The upper surfaces are entirely metallic green, with the ear coverts and neck patch purple. Chin to breast is metallic green with a border of metallic blue; the rest of the underparts are purple with the centre of the belly unglossed and blackish. The eye is dark brown, the bill, legs and feet black. Sexes are alike, size 7½ - 9 in. (19 - 21 cm.).

In the *Avicultural Magazine* 1955, 61, 6; 267 - November/December, John Yealland described the Emerald Starling and there is a colour plate by David M. Henry painted from examples brought back in 1954 by the joint BBC and Zoological Society of London expedition to Sierra Leone when 26 specimens were collected, mostly birds in immature plumage. Those depicted in the colour plate are in adult plumage.

Some of these birds went to Foxwarren Park, home of the then President of the Avicultural Society, Alfred Ezra OBE and father of the Society's current President. This is the first reference I can find of the bird in aviculture. Raymond Sawyer had at least one of these birds which he showed at the National Exhibition of Cage Birds, Alexandra Palace, London in December, 1975.

Emerald Starlings were imported by Ponderosa Bird Aviaries in 1979. Gordon Cooke, a well known importer, also offered some for sale but said he found them very difficult to establish. Soon a number of aviculturists had added these beautiful starlings to their collections. Among them, several birds found their way to the joint collection of Ruth Ezra and Raymond Sawyer at Cobham, and in 1980 young were reared there. This was probably a world first and on various occasions since, the species has again bred in that collection.

The only other known 'successful' breeding in great Britain was

achieved by Will Harrison at Wem (Shropshire). A single bird left the nest and became self-supporting but failed to moult into adult plumage. *The Foreign Bird Federation's Register of Birds Bred in the UK Under Controlled Conditions* from 1985 to 1991 has no records of any breedings.

Malcolm Ellis, *Avicultural Magazine* 1980, **86**, 2; 112 makes a brief mention of the Emerald Starlings kept at London Zoo. They often carried green privet leaves which they sometimes took into the various nestboxes provided. In the United States, two young were bred at Philadelphia Zoo, *Avicultural Magazine* 1982, **88**, 1;58.

I have kept six birds of the species over a 10 year period. The first pair was bought on 29 December 1982 and had been viewed previously. They were quite wild when kept in a cage but after being wintered indoors they were transferred to an outdoor aviary measuring 8 ft. long x 2½ ft. wide and 6 ft. high (2.5 m x 75 cm x 2.1m), with an access to a feeding cage, measuring 2 ft. x 2½ ft. x 3 ft. high (161 cm x 776 cm x 91 cm), indoors in a birdroom. Part of their daily diet - Orlux softbill food (with Claus added occasionally) and mealworms - was given in this indoor section. Outside on spikes were halved pears, apples or orange, plus a dish of sliced fruit including grapes. Ant pupae were offered but not taken. This pair hatched a single chick in 1986 which lived for less than three days.

Another bird was purchased in May, 1989 but died a few months later. A further pair was obtained in December of that year, and another single bird was acquired in July, 1990. By Christmas, 1991 three birds remained. All had been split rung for ease of identification - only for one of them to lose its ring. In February, 1992, a bird was found dead, badly pecked around the head. Was I, perhaps, left with a pair coming into breeding condition?

The aviary had been extended at Easter, 1991 into a single flight 10 ft. x 8 ft. x 6 ft. high (3 m. x 2.5m x 2.1m) utilising three smaller aviaries. Other occupants were three cock and two hen Red-headed Finches *Amadiah erythrocephala*, a pair of Silver-eared Mesias *Leiothrix argentauris*, a hen Amethyst Starling (on loan), a one-eyed Black-headed Sibia *Heterophasia capistrata* and numerous Diamond Doves *Geopelia cuneata* - reduced to two pairs on 15th March at which time one of the cock Red-headed Finches was also removed as the others had paired. The adjoining flight housed a pair of Red-tailed Laughing Thrushes *Garrulax milnei*.

The remaining Emerald Starlings consisted of a cock bought in

July, 1990 and a hen purchased in December, 1989. Two nest boxes were available (as had been the case in 1991); one was a hollowed-out log approximately 12 in. x 15 in. high (30 cm x 38 cm.), fixed to a pole 2 ft. 6 in. (76 cm.) off the ground, with a man-made wooden lid and a 2 in. (5 cm.) entrance hole. The chosen box was 15 in. x 10 in. x 10 in. (38 cm. x 25 cm. x 25 cm.), hung at an angle of 45 ° and made of 1 in. (2.5 cm.) rough-cut timber. It was fixed to a 2 ½ in. x 1 in. (6 cm. x 2.5 cm) piece of timber that formed part of the aviary frame. The entrance hole was 2 in. (5 cm) in diameter and 4 ft. 9 in. (1.45 m.) from the aviary floor, facing westwards. The box was 4 ft. 6 in. (1.4 m.) from the front of the aviary with a flowering currant bush between.

During March both birds were observed carrying grass, coconut fibre and green shoots from the flowering currant into the nest box. Although timid and shy, they appeared to be sitting and on 27th March when both were off the nest, inspection revealed two eggs. Two days later, three eggs were in the box. They were typical of starlings - light blue with red/brown blotching.

On 6th April what appeared to be two newly hatched chicks were in the box. I had obtained a supply of mini mealworms and these were dusted with a vitamin supplement (SA37) before being fed. The following day a broken eggshell on the aviary floor provided evidence that the third egg had hatched. The egg shell looked quite pointed.

Regular checks were made as the nestlings grew and the Black-headed *Sibia* was removed on 12th April to reduce competition for live food. I handled the three chicks on 23rd April to see if all was progressing correctly. Their legs appeared sound and they were well fed.

On 27th April, all three youngsters were out of the nest by late afternoon when I returned home from work. They were smaller and paler editions of their parents with underparts that were more brown than purple. The green areas of their plumage developed fairly quickly and by Christmas it was similar to that of the adults. By the end of March, 1993 one juvenile had assumed virtual adult plumage and by June all three were identical to their parents.

At about the time they were expected to fledge, water dishes had been partly emptied as a precaution in case the youngsters fell into them. On the night in question it rained. The birds seemed likely to roost in a Jasmine bush so a couple of pieces of glass were put on the top of the aviary to provide some measure of protection and all was well the following morning. Although they could fly, the

youngsters preferred to remain in the bush and clamber around, calling to be fed by their parents.

The fledglings survived a torrential downpour during early May and the following day split rings were put on, providing another opportunity to handle them and confirm that they appeared to be developing well. The weather was generally fine for the rest of the month except for a spectacular thunderstorm during the evening of 23rd May which, in the event, caused the birds no problems.

While they were in the nest, regular supplies of mealworms were provided - up to six times a day if my father was available to help while I was at work. The young starlings took to their parents' diet (which in 1992 was Orlux insectivorous mixture together with chopped grapes, apples, pears and bananas, plus spiked fruit and mealworms) without problem. Waxmoth larvae were provided from time to time, as were ant pupae when available, together with such insects as the adults were able to capture themselves. Fresh water was given every other day.

I have often wondered how intelligent Emerald Starlings are compared to other members of the family and they certainly appear more timid than, say, Purple Glossy Starlings. They appear to display a lack of intelligence when compared with, for example, my pair of Meve's Starlings *Lamprotornis mevesii*. However, when the adult Emerald Starlings were feeding young in the nest they would closely observe what I was doing in the vicinity, so that when I was out of sight one or both birds would return to the nest immediately. Other aviculturists have commented that both Emerald and Amethyst Starlings *Cinnyricinclus leucogaster* are generally not as intelligent as Glossy Starlings *Lamprotornis*.

In late February 1993, while we were experiencing a spell of mild weather, the youngsters were separated from their parents and housed in an aviary opposite. It was an action which seemed to galvanise the adult pair into breeding behaviour again. On this occasion they chose the log rather than the previously used box. Three eggs were laid and incubated (incubation was estimated at 13 - 15 days), and all three hatched. Unfortunately the nestlings failed to survive beyond five days - perhaps because I failed to send off an order for mini mealworms quickly enough. All the adults had to feed their brood were regular-sized mealworms and even though they were cut up they were still on the large side.

This was a disappointing outcome - but better things were to follow and a further two chicks were successfully reared later last year. At the time of writing these notes (September, 1993) the

youngsters are starting to show colour in much the same way as did the 1992 brood.

I suspected the Emerald Starling found dead, and injured around the head, in 1992 was almost certainly attacked by its own kind. Raymond Sawyer, who has considerable experience with the species, has experienced aggression from time to time, especially around breeding time. Obviously my flight is small leaving little opportunity for birds to get away from each other.

At present, Emerald Starlings are still available from UK importers - and at prices that are quite reasonable. If you have admired this species it would be well worthwhile adding them to your collection while the opportunity is there.

REFERENCES

- MACKWORTH-PRAED, C. W. and GRANT, CHB. (1973): *African Handbook of Birds*, Series 3, Volume II, *Birds of West Central and Western Africa*, plate 55, page 474.
- BANNERMAN, D. A.: *Birds of Tropical West Africa*, Volume VI, page 41. *Avicultural Magazine* 1955, 61, 6; 267.

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HAND-REARING THE BLUE-CROWNED RACKET-TAILED PARROT

By R. G. Sweeney and R. G. De Dios
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The Blue-crowned Racket-tailed Parrot *Prioniturus discurus* is one of several species belonging to the genus *Prioniturus*, none of which could be described as widely known and certainly not aviculturally established at the present time. The Research and Breeding Centre operated by B.I.I. in the Philippines specialises in the captive management and breeding of Philippine, Indonesian, New Guinea and South-east Asian endemic Psittacines.

The ability to work with these birds within their own natural range and climatic conditions, aided by the use of natural food items provided as part of a balanced diet, has meant that several species of Psittacines, formerly regarded as being not adaptable to captive conditions, have now become 'captive established' at the centre. Species of the *Prioniturus* genus are among those with which success has now been achieved here.

The Blue-crowned Racket-tailed Parrot is perhaps now the best known species of its genus. Although not widely known in the past, it has recently become aviculturally established. From the main captive population base formed at the centre, it has already been possible to allow some captive-bred birds to go to avicultural collections in Europe.

Plumage of birds of the species is predominately green, becoming more yellowish on the underbody. The other significant colour is the blue on top of the head which gives the species its common name. The bill is white in adult birds, dull grey in newly-fledged youngsters. The feet are grey and the toe nails dark grey to black. The most noticeable feature of this and other *Prioniturus* species is the presence of elongated tail shafts which have spatules at their tips.

Several pairs have become established and are now regularly reproduced at the B.T.I. Centre and with clutches commonly resulting in four, occasionally five, chicks, the reproductive potential of these birds is good. Once problems associated with the captive husbandry of *Prioniturus* species had been realised and provided for, success followed. To begin with, a majority of the

eggs produced were removed from nest-boxes for artificial incubation and hand-rearing.

In 1992, 22 birds were artificially hatched and successfully reared in the centre's nursery department. Currently, more emphasis is being placed on perfecting husbandry guidelines to allow for successful parent rearing, which has also now been achieved here. This article describes the experiences we have gained from hand-rearing young birds of the species. A full report describing the research which has resulted in the centre's current successful husbandry practices is also in preparation and will be available shortly.

INCUBATION

Eggs have previously been removed from the nest-boxes of parent birds only after a period of natural incubation, normally of at least 14 days. This has resulted in an extremely high percentage of successful hatches. The species' incubation period is currently considered to be 24 days. To date, only a limited amount of work has been undertaken with fresh eggs so a definitive artificial incubation husbandry guide cannot currently be provided. With eggs removed from the nest after a period of initial natural incubation, incubation husbandry is undertaken as follows.

Temperature: incubation temperatures of 37.2° to 37.4°C. have been used to incubate the eggs of this *Prioniturus* species with a high level of hatchability, provided the exact temperature used remains constant throughout the incubation period.

Humidity: a reading on the wet bulb thermometer of 26.7° to 27.8° C. is used with few weight loss problems being encountered with eggs removed from the nest-box after a period of natural incubation (27.8°C. is equal to a relative humidity reading of 53%).

Turning: during incubation the eggs are turned by hand at least seven times during a 24 hour period. The eggs are rotated 180 degrees, always in alternating directions at each turning period. To date this has proved successful as the eggs have generally achieved a percentage vein growth within the available albumen space of between 70 - 100% by the time they have been removed from the nest-box. Artificial incubation of freshly-laid eggs may well prove to require more detailed attention with regard to turning husbandry in order to achieve a similarly high level of success.

Hatching: to date, hatching has proved relatively uneventful with few specific problems encountered. The period from internal pipping to eventual emergence from the shell has, in nearly all cases, been 48 hours or less. Percentage hatchability has been

extremely high and assistance to eggs in the hatching process has not been required to date. Eggs are transferred from the incubator to the hatcher once they have clearly internally pipped and are active within the air cell, or once external pip has been achieved. Environmental conditions of the hatcher are an internal temperature of 36.9°C. and a humidity reading on the wet bulb of 32.2°C. or above (equal to a relative humidity of 71%). Once internal pip has been achieved the egg should no longer be turned.

HAND-REARING METHOD

On removal from the hatcher, the chicks are transferred to a pre-prepared brooder unit. The initial temperature of the brooder is maintained at 36.6°C. During the early stages of its rearing period, the chick is placed inside a small plastic tub which is lined with paper towelling. This provides support to help the newly-hatched chick maintain an upright body position and the use of paper towelling also allows for easy examination of the chick's faeces.

The brooder temperature is slowly lowered as the chick becomes larger and stronger. Once it has outgrown its plastic container and has control over its body posture and movement, it is allowed more freedom by being transferred to the more spacious accommodation of a cage. The chick is now kept upon segments of cotton cloth which are replaced and sterilised frequently (in the Philippines' hot and humid tropical climate, this proves the easiest substrate to sterilise and frequently replace). Sterilised perches are provided within the rearing cage as soon as the chick becomes more mobile and shows a willingness to attempt climbing.

The diet used at the centre to feed these chicks is based on two formulas. The first is an easy to digest mixture which is fed to the chicks from day two to day 10. The second formula, which is the main basis of the rearing diet, is introduced with the first formula from day five, and then gradually replaces it by day 10. For the first day only, Lactated Ringers Solution with Volamin is fed.

This formula is prepared and fed to the chicks at a temperature of 40° to 42°C. throughout their rearing period. Evenness of temperature throughout the food is ensured by stirring the formula, using a thermometer, prior to the commencement of feeding. One of the most noticeable features of chicks of this species is their very small crop capacity when newly hatched - usually a maximum of 0.2 ml. This means that chicks being reared from day one have to be fed throughout the night as well as during daylight hours. At the centre, newly hatched chicks receive additional night-time feeding at 1.00 am and 4.00 am, as well as being fed every two hours

throughout the day from 6.00 am until midnight.

The ingredients of the two formulas are as follows:

Formula 1

250ml	-	Boiled Distilled Water
2 tbsp	-	Quaker Oats
2 tbsp	-	Hi-protein
1 tbsp	-	Ceresoy

Formula 2

275 ml	-	Boiled Distilled Water
2.5 tbsp	-	Hulled Sunflower Seed (pressure cooked)
3 tbsp	-	Quaker Oats
2 tbsp	-	Apple Jungle Pellets
2 tbsp	-	Fruitivore Pellets
2 tbsp	-	Ceresoy
1 tbsp	-	Hi-protein
1/8 tbsp	-	Di-ca-fos
1/8 tbsp	-	Avia
1/3 tbsp	-	Presistimil
150 ml	-	Papaya (pressure cooked)
60 ml	-	Apple Sauce (Gerber)
3 ml	-	Vitamins B and K

Often, if the chicks are not receiving sufficient food during the night time period, they can become hyper-active while calling for food during the early hours of the morning and the constant rubbing of feet by such energetic chicks can lead to tiny blood spots which can be detected on the substrate medium on close examination. The presence of such spots is a sign that the chicks are being left without food for an unsuitably long period during the night.

The type of feeding implement normally used is a syringe. The number of feeds given daily and the quantity of food given at each feed depends on the development of individual chick, but the following guide lines provide a basis to work from:

From day 30 until day 60, the amount of food is increased slowly until the maximum crop capacity - which for *P. discurus* is 12 ml. - is eventually reached. The chick will continue to receive four to five feeds daily, even as weaning begins. The chick will begin to refuse food as it begins weaning and this will prove to be the best guide to when to reduce hand-feeding. Weaning food in the form of fruits, millet sprays and Fruitivore pellets is provided once weaning has been initiated.

AGE IN DAYS	NUMBER OF FEEDS	QUANTITY AT
	DAILY	EACH FEED
day 1	12	0.2 - 0.3 ml
days 2 - 3	12	0.4 - 0.8 ml
days 3 - 5	8	1.2 - 2.0 ml
days 5 - 7	8	2.0 - 3.5 ml
days 7 - 10	7	3.3 - 4.0 ml
days 14 - 21	7	4.0 - 5.0 ml
days 21 - 30	6	5.0 - 6.0 ml
days 30 - 60	6	6.0 - crop capacity

Birds which have spent the early part of their rearing period in the nest-box, receiving care from their natural parents before being removed for artificial rearing, seem to wean faster than those chicks which were incubator hatched. The earliest weaning time recorded at the centre was 85 days in the case of a chick which was reared by its parents for 21 days before being transferred to the nursery department for hand-rearing.

Chicks which are hand-reared from day one take between 90 - 130 days to wean completely. Weaning of *P. discurus* can be considered comparatively straightforward, with few specific problems being encountered with this species. Chicks are still hand-fed up to the time they refuse such hand-feeding. In many respects their husbandry during weaning is reminiscent of Loriidae.

PHYSICAL DEVELOPMENT OF CHICKS

The following notes were made on the physical development of an incubator-hatched chick, the oldest of a clutch of four removed from the nest-box as eggs and subsequently hand-reared in early 1993.

'Newly-hatched - skin pigmentation is light pink. Dense, long white down covers most of the upper body including the head, wings and thighs. Down is also present on the underbody, but spread more thinly. Bill is pinkish-white with a very small egg tooth visible. Toe nails are white. Eyes are enclosed at hatching but are already noticeably prominent in their size. Chick is very vocal. Noticeably small crop capacity, only 0.2 ml. Very active, continually moving.

'Day 2 - little physical change but the chick has become more settled in its behaviour.

' Day 4 - bill is now completely white.

' Day 8 - eyes just beginning to slit.

'Day 11 - eyes are opening.

'Day 13 - eyes fully open, chick very active. Toe nails are now grey.

'Day 20 - pins that can be seen forming under the skin are becoming more widespread over the body, but are not yet breaking through the skin. Flight feather pins just beginning to appear on the wings.

'Day 23 - flight feather pins now well emerged. Smaller pins also now starting to break through the skin on the wing and elsewhere on the body.

'Day 25 - pins are now emerged over much of the upper wings. Toe nails have now become black.

'Day 27 - most of the upper wings covered by long pins. Pins also now appearing on the tail and thigh.

'Day 30 - flight pins are now more than 1cm in length. Bill is white but the base is becoming darker.

'Day 32 - flight feathers are starting to break through their quilling.

'Day 34 - feathers on the head, thighs, tail and chest are all starting to break through their quilling. Even pins on crop. Bill colour is becoming slightly darker.

'Day 37 - feathers emerging from quilling on the head, legs and more extensively on the chest. All flight feathers are now emerged from their quilling. Bill has become greyish-white in colour.

'Day 41 - green feathering has now emerged over most of body, except for the upper flanks. Wing feathering is near complete.

'Day 44 - chick is now regularly using the perching provided for it to rest on. Chest and wings are now completely feathered, rest of body is nearing complete feathering except for the upper flanks which are just beginning to become feathered.

'Day 53 - blue coloration in the plumage of the crown is becoming brighter and more noticeable. Rackets are also now noticeable on the elongated tail shafts. Flank areas becoming well feathered.

'Day 60 - complete feathering. Bill is still greyish-white, indicating immaturity. Also, the iris are dark. Otherwise the chick now resembles an adult bird.'

The normal method of monitoring the physical development of the chick, other than by direct observation, is to monitor the daily pattern of weight gained over each 24-hour (one day) period. Of the 22 chicks hand-reared at the centre during 1992, the weight gain records of 10 birds were selected to be averaged in an attempt to

provide a relatively accurate guide to the weight gain pattern for this species.

The 10 chicks which made up the sample group were selected as having had an uneventful rearing period with no problems which might alter the eventual average figure calculated. As with any species, the Blue-crowned Racket-tailed Parrot is subject to variance in individual birds' hatching weights and daily weight gain patterns. Because of natural individual variance, in addition to the averaged figure of weight gain, a further guide in the form of a range of variance is provided to show the greatest and least weights recorded among the sample group of chicks on each stated day.

AVERAGE WEIGHT GAIN DEVELOPMENT

(based on a sample of 10 successfully hand-reared chicks)

AGE IN DAYS AVERAGE WEIGHT RANGE OF VARIANCE

1	7.01 grams	6.55 - 7.51 grams
2	7.67 grams	6.42 - 9.97 grams
3	8.50 grams	7.00 - 10.31 grams
4	9.29 grams	7.22 - 12.00 grams
5	9.71 grams	8.03 - 13.00 grams
6	10.80 grams	8.51 - 14.00 grams
7	13.71 grams	11.00 - 16.00 grams
8	14.49 grams	11.21 - 16.47 grams
9	14.87 grams	12.01 - 17.00 grams
10	16.30 grams	15.02 - 18.00 grams
11	18.78 grams	16.93 - 20.78 grams
12	20.30 grams	18.81 - 20.81 grams
13	22.88 grams	20.71 - 24.08 grams
14	25.51 grams	23.84 - 27.92 grams
15	25.41 grams	22.67 - 28.31 grams
16	27.90 grams	25.47 - 33.21 grams
17	29.30 grams	24.36 - 36.28 grams
18	30.48 grams	25.21 - 38.12 grams
19	32.98 grams	28.00 - 40.05 grams
20	35.46 grams	29.24 - 42.10 grams
21	37.06 grams	29.97 - 44.41 grams

SUMMARY

The breeding of *P. discurus* at the Research and breeding centre is now regular and considered routine with a high level of success being achieved. Currently, a greater emphasis is being placed on

parent-rearing of the species. The ability to hand-rear is, however, not only necessary on occasions but also provides the opportunity to greatly increase the productiveness of specific pairs which is desirable when an aviculturist may be working with a limited number of blood lines. The species has shown itself capable of double clutching and producing up to four, very occasionally five, chicks per clutch.

A more detailed husbandry guide for incubation may be researched in the future, but currently nearly all eggs that have been worked with have been partially incubated naturally, under the parents, prior to their transfer to the incubation room.

Hand-rearing can be successfully achieved so long as proper consideration is given to providing additional night-time feeding, as well as the normal 6.00 am - midnight schedule common for most other Psittacines. Failure to provide adequate night feeding will result in nutritional problems and physically poor condition chicks being produced.

The need to establish species of *Prioniturus* in captivity must be clear to anyone familiar with the conservation management of species. Although spread over a comparatively wide distribution, much of the natural range of the species is disappearing at an increasing rate. Populations are becoming isolated from each other and are increasingly disturbed by a growing human population. Now that the Blue-crowned Racket-tailed Parrot has become established in an initial captive population, and is reproducing freely, it will be up to aviculturists around the world to establish a self-sustaining population of the species that will ensure its continued existence for many generations to come.

Requests for more information about husbandry management, neonatal care or products mentioned in the text are invited and should be addressed to: Research and Breeding Centre, Birds International Incorporated, 99 Timog Avenue, Diliman, Quezon City, Philippines .

* * *

CONSERVING THE RED-VENTED COCKATOO

By Rosemary Low (Gran Canaria)

The Philippine or Red-vented Cockatoo *Cacatua haematuropygia* is now among the 20 or so most critically endangered parrots in the world. Once widespread throughout the islands of the Philippines, not until two or three years ago was it realised that this distinctive cockatoo had suffered a massive population decline as a result of deforestation and trapping. Between the 1930s and the 1980s, 80% of the forests were destroyed - and the destruction continues. Now the cockatoo is known to survive only on the island of Palawan.

This cockatoo has never been common in aviculture. Export of wild-caught birds has not been permitted since it was placed on Appendix 1 of CITES over a year ago. When it was exported mortality in recently trapped birds was high. Unfortunately, females were always in the minority and the number of breeding pairs in existence is very few.

The first step towards preserving this species in aviculture was taken last year with the formation of an EEP (European breeding programme). Everyone who keeps this species (even only a single bird) is urged to contact the co-ordinator of this EEP, Marc Boussekey, Espace Zoologique, St. Martin-La-Plaine, 42800 Rive-de-Gier, France. Recording the location of as many birds as possible is now very important.

This breeding effort has been linked with a conservation programme for this species in the wild. An agreement was signed recently between Espace Zoologique and the government of the Philippines. The zoo funded and produced a poster in English and in two Philippine languages for distribution throughout the islands. It emphasises that the cockatoo must be protected. Prints of the poster artwork, beautifully depicting a small flock in the wild, are available in a limited edition of 200. The price is 100FF each (about £12.50 plus postage and packing) payable to Association Zoologique at the above address. All profits from the sale of this print will go directly to the conservation of the Red-vented Cockatoo.

* * *

HUSBANDRY AND REPRODUCTION OF THE RED-FACED MOUSEBIRD

By Michael Macek and Bruce Bohmke (St. Louis Zoo.)

Mousebirds represent the order *Coliiformes*, the only order of birds endemic to Africa (Fry, 1988). According to Fry (1988) this order is comprised of two genera, *Colius* (four species) and *Urocolius* (two species). All six species have been kept and bred in captivity, mostly those of the genus *Colius* but few have bred consistently. The following observations are of the Red-faced Mousebird *Urocolius indicus*.

The St. Louis Zoo acquired six wild-caught Red-faced Mousebirds in December 1985. The birds were placed in a large open flight aviary where Speckled Mousebirds *Colius striatus* have bred successfully. The aviary measures approximately 9 m x 6 m x 6 m, is well planted and receives natural light. By 1988 only one pair remained which bred for the first time in May of that year. Their first nesting resulted in two chicks but their subsequent breeding attempts were unsuccessful until 1990 when they were moved to a smaller aviary.

The birds are offered a mixture of chopped fruit (apple, orange, banana, grape), diced canned vegetables (corn, black-eyed peas, carrots, and beets), Apple Jungle Pellets (Marion Zoological Inc.), and insects (crickets, waxworms, and mealworms). Colour is maintained by the use of a 10% canthaxanthin solution (Quintrex) mixed with the food. Food and water are offered once a day unless young are being reared when a fresh food supply is provided in the afternoon. The birds feed from an elevated platform but willingly come to the ground if a platform is not provided.

The smaller enclosure measures 3 m x 3 m x 3.7 m. It also receives natural light. This aviary has a piano wire front of which the wires are spaced 1.25 cm apart. Live plants, branches, and honeysuckle vines, in which the birds spend most of their time climbing around, are provided. Small woven baskets (12.7 cm diameter) are normally used for nests although the birds have also built their own from fine grasses and wool. The mousebirds have sometimes shared their aviary with a single Barbary Shrike *Laniarius barbarus* or a Brown-breasted Barbet *Lybius melanopterus* both of which were aggressive and were removed. A pair of Cape Thick-knees *Burhinus capensis* now share the aviary with them and as

ground birds present no threat.

Fry (1988) reported seasonal nesting with peaks in late summer and early autumn. In captivity nests have been recorded in every month. Eggs are usually laid 48 hours after the female commences sitting in the nest and chicks have been found 15 days later. Hence, the incubation period is somewhere between 12 and 14 days. This agrees with Fry (1988) and observations of the Blue-faced Mousebird *Urocolius macrourus* by Gibson (1979). Clutch size averages 1.76 eggs (1 - 3 eggs, 26 clutches). Fry (1988) found wild clutches averaged 2.55 eggs (1 - 7 eggs, 80 clutches). It has been suggested that mousebirds are co-operative and sometimes communal breeders (Fry, 1988) and therefore these large clutches may be the result of more than one female laying in the same nest. Only one reproductive pair has been housed in the same aviary at the St. Louis Zoo. Eggs of *Colius* species are uniformly white (Fry, 1988; Grant, 1962) but the two species of *Urocolius* produce white eggs with spots and scrawls of reddish brown.

Both the male and the female and sometimes a helper (a juvenile from a previous clutch) incubate the eggs. However, the female does most of the incubation. When a helper incubates it always sits beside one of the adults. The eggs are often left unattended for brief periods when the female leaves the nest to feed. The male has never been observed feeding the female on the nest as was the Blue-naped Mousebird by Gibson (1979). Unsuccessful nests are always abandoned after 15 days incubation although Berman (1985) reported Speckled Mousebirds incubating for as long as 22 days before abandoning the nest.

Normally one or two young hatch (of 16 nests, six resulted in two chicks and 10 resulted in one. The chicks are fed by both parents. The juvenile helpers defend the nest and brood the chicks but have never been observed feeding them. Chicks leave the nest when they are 10 - 14 days old. They return to the nest frequently for the first day or two but by the fourteenth day are fully fledged. The female often returns to the nest and begins laying another clutch within 48 hours of the chicks fledging. The chicks are then fed by the non-incubating adult but soon begin picking up food on their own. Because of their co-operative nesting habits, the chicks are left with the adults until at least one subsequent clutch has been reared. This period can range from 8 weeks to almost 6 months. The carrying capacity of the aviary seems to be approximately six birds as reproduction has decreased or stopped altogether when this number has been exceeded for a while.

In 1991 a second pair of mousebirds were housed in an off-exhibit enclosure which measured approximately 1.5 m x 1 m x 1m and was suspended 1.2 m from the floor. Visual barriers were placed on two sides of the cage as the birds appeared more easily disturbed in this smaller aviary. The pair consisted of a 2½ year old male from the original pair and a 3 year old female from Miller Park Zoo, Bloomington. Three chicks were reared by this pair. To date the St. Louis Zoo has produced 24 Red-faced Mousebirds.

Mousebirds are unique. They are relatively hardy and will breed in a variety of exhibit types. They can be kept in groups the number in which depends on the size of the exhibit. Although they compete with some perching birds for space they will co-habit with ground species. All six species are currently kept in captivity. Recent ISIS abstracts report none being maintained in sufficient numbers to support a long-term population, with the possible exception of the Speckled Mousebird, and the genetic viability of this population is uncertain. If this order of birds is to be maintained in captivity it may be necessary to concentrate on one species giving particular attention to its genetic management.

REFERENCES

- BERMAN, S. Notes on the Behaviour of the Speckled Mousebird *Colius striatus*. *Avicultural Magazine* 91: 231 - 235, 1985.
- FRY, C.H., KEITH S., URBAN E.K. *Birds of Africa* .Volume 3. Academic Press. San Diego, California. 1988.
- GIBSON, L. Breeding the Blue-naped Mousebird. *Avicultural Magazine* 85: 146 - 156, 1979.
- GRANT, C.H.B., MACKWORTH-PRAED, C.W. *Birds of the Southern Third of Africa*. Longmans, Green and Co. London. 1969.

* * *

LETTER TO THE EDITOR

Dear Sir,

With reference to Mr. Paul Irven's article in Volume 99, Number 3. He wishes to know if Cape Barren Geese have been kept with any other mammals or birds. For the last 12 years I have kept a pair in an enclosure measuring 250 ft x 50 ft (76.25 m x 15.25 m) with a pair of Polish Mute Swans and two pairs of Parma Wallabies, and all of them have bred without problem.

Yours,

Ken. Dolton

* * *

NEWS AND VIEWS

PHEASANT PIGEONS BRED

Although the Pheasant Pigeon *Otidiphaps nobilis* has been represented in the collection at Birdpark Avifauna (Alphen aan den Rijn) for 12 years, it was only in 1993 that these striking-looking birds were bred there. Purple-tailed Fruit Pigeons *Ducula rufigaster* and Black-chinned Fruit Doves *Ptilinopus lechlancheri* also reared young.

Scarlet Ibis *Eudocimus ruber* enjoyed a successful breeding season and by mid-September 33 young had been hatched, while five Straw-necked Ibis *Carphibis spinicollis* were also hatched. Other species to breed in the park during 1993 included Sarus Crane *Grus antigone*, East African Crowned Crane *Balearica regulorum gibbericeps*, Chilean Flamingo *Phoenicopterus chilensis* and African Spoonbill *Platalea alba*.

In the park's Tropical House, White-collared Kingfishers *Halcyon chloris* laid a second clutch of eggs but only one hatched. A single Violet-backed Starling *Cinnyricinclus leucogaster* also fledged.

Hans van der Sluis

* * *

SUCCESS WITH FRECKLED DUCK

Freckled Duck *Stictonetta naevosa* in The Wildfowl & Wetlands Trust's Slimbridge collection had an extremely successful breeding season in 1993, producing 23 young. Magpie Geese *Anseranas semipalmata* also bred, while for the first time in more than a decade Bewick's Swans *Cygnus columbianus bewickii* laid fertile eggs. Ringed Teal *Callonetta leucophrys* and Fairy Bluebirds *Irena puella* reared young in the Tropical House

* * *

KAGU REINTRODUCTION

The flightless Kagu *Rhynochetus jubatus*, New Caledonia's national symbol, is the subject of a reintroduction programme at the Provincial Park of Rivière Bleue.

* * *

FIRST WITH BROADBILLS

The world's first successful captive breeding of the Lesser Green broadbill *Calyptomena viridis* has taken place at San Diego

Zoo in 1993. Two chicks of the northern subspecies *continentis* left the nest on 13th and 16th August, respectively. Curator of Birds, David Rimlinger feels the success was partly the result of removing the cock from the pair's enclosure as soon as the hen laid her eggs - thus creating a less stressful environment. The eggs were incubated for 17 days in a domed nest made of palm fibres, Spanish moss and goat hair.

* * *

KESTRELS PROSPER

More than 200 Mauritius Kestrels *Falco punctatus*, including at least 42 breeding pairs, are now flying free in three areas of Mauritius - the Bambou Mountains, Moka Mountains and Black River Gorge. When the Mauritius Kestrel Conservation Programme began in 1973, only four individuals remained in the wild.

* * *

LAMMERGEIER PROJECT

The Lammergeier *Gypaetus barbatus meridionalis* is sparsely distributed throughout Kenya, with a maximum of about 20 - 30 pairs. The best known and most easily observed pair used to nest on the main rock-face in what is now Hell's Gate National Park, eight miles south-east of Lake Naivasha. However, breeding there ceased in 1975 and in 1983 the pair disappeared, probably driven away by the substantial amount of human activity close to the nest site.

Now, Simon Thomsett hopes to stop rock climbing and similar pursuits in the immediate vicinity - as well as perhaps enlarging the nest ledge and hacking back some young Lammergeiers, possibly in the next two years. First, though, he must overcome opposition. He has been asked either to relocate the proposed nest site or allow climbing to continue on the rock-face. Rightly, no doubt, he feels that such activities should themselves be moved elsewhere if his plan is to succeed.

Simon has undertaken rescue work with other birds of prey, including completing recently a similar programme with the rare Madagascar Fish Eagle *Haliaeetus vociferoides*. Any member who can offer help or support should contact: Simon Thomsett, P.O. Box 42818, Nairobi, Kenya.

Malcolm Ellis

* * *

IBIS REDISCOVERED

Two specimens of the Giant Ibis *Thaumatibis gigantea* have been observed in Laos by members of the Laos 92/93 Expedition, joint winners in the Tropical Rain Forest category of the 1992 ICBP/FFPS Conservation Expedition Competition. The species had not been seen for 30 years.

* * *

FIRST CAPTIVE HONEYCREEPER

A young Crested Honeycreeper *Palmeria dolei*, dislodged from its nest during a storm, was taken to the Olinda Endangered Species Propagation Centre on Maui when efforts to restore the two-weeks old nestling to its parents failed. It is the first bird of the species held in captivity and reports say that efforts are to be made to obtain a mate for it.

* * *

LICURI PALM SCHEME

Plans have been made to plant 20,000 - 30,000 licuri palm trees in Bahia, eastern Brazil. The nuts of the licuri palm are the main food of the rare and endangered Lear's Macaw *Anodorhynchus leari*, of which just some 65 or so are known to be living in the wild in thorny scrubland in the Brazilian state of Bahia. The macaws have to fly considerable distances to their feeding grounds where each bird is reckoned to eat about 350 nuts each day.

As land is cleared for cattle, the palms often are left standing - but only so their dry leaves can be used as fodder during the long dry season. Not surprisingly, the continual loss of leaves causes the palms to deteriorate and some die. In areas where goats range, few seedlings and young palms manage to regenerate. Forced to forage even further afield, the macaws may even descend to the ground in search of food. They become increasingly easy targets for hunters, who may shoot them for food or try to capture them.

For a donation of £10 (US \$20) sent to 'A Palm for a Parrot', The World Parrot Trust, Glanmor House, Hayle, Cornwall, TR27 4HY, England, the donor will receive an inscribed certificate suitable for framing. The story of Lear's Macaw and its struggle to survive is described on the back of the certificate.

Malcolm Ellis

* * *

SET-ASIDE VICTIMS

A report in *New Scientist* says that in the UK hundreds of thousands of birds' eggs and nestlings were destroyed in 1993 because the government allowed farmers to start ploughing set-aside fields in order to control weeds at the height of the breeding season in May. Several species, including Lapwing *Vanellus vanellus*, Snipe *Gallinago gallinago* and Skylark *Alauda arvensis* were attracted to nest in more than 240,000 ha of the land left fallow under the scheme.

* * *

STUDBOOK PUBLISHED

The 1992 European Studbook for the Red-crowned Crane *Grus japonensis*, recently published by Rotterdam Zoo, shows a captive population of 135 birds (64.64.7).

East African Crowned Cranes *Balearica pavonina gibbericeps*, enjoyed an excellent breeding season in 1993 being hatched in at least nine collections with a total of over 30 reared.

Dave Coles

* * *

VISITS TO MEMBERS' COLLECTIONS

After a positive start, visits to members' collections have failed to attract much support. A visit to Flimwell Bird Park last year was initially of interest to nine members - but on the day, not one turned up.

This was both upsetting and disappointing for Dr. and Mrs. Player who had gone to considerable trouble to arrange tea and to organise a good day for the Avicultural Society.

Can we therefore ask members, if they take a ticket for one of these visits and subsequently find they are unable to attend, please advise their host to that effect. The Society is entirely dependent on the generosity of members who are willing to open their collections to fellow enthusiasts and their kindness should not be abused.

A visit to three Essex collections planned for September was cancelled due to lack of support.

* * *

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The Society has a limited number of prints of a colour plate painted by D. M. Henry and published in the May/June 1964 issue of the Avicultural Magazine. The subject is a Blue Snow Chat or Grandala. The prints are supplied on a quality card mount ready for framing for £7.50 including postage and packing.

Despatch will be approximately 12 weeks from receipt of payment. Please mark your envelope "Blue Snow Chat Print" and forward request, as soon as possible, printing your name and address clearly in block capitals to: The Society Co-ordinator, The Avicultural Society, c/o Bristol Zoological Gardens, Clifton, Bristol, BS8 3HA, England.

February 1994

Centenary Souvenirs

To mark the Society's Centenary year, commemorative ties and head squares are offered to members subject to demand. The ties are of woven polyester in dark blue with a single motif in white depicting a Cock-of-the-Rock and the words Avicultural Society 1894 - 1994, at a cost of £9.99 including postage and packing. Similar ladies' head squares are also available for £7.99 including postage and packing. There is a minimum order requirement from the manufacturers of 150 (ties) and 24 (squares) and delivery would be in approximately 10 weeks. Please indicate your interest as quickly as possible to: The Society Co-ordinator, The Avicultural Society, c/o Bristol Zoological Gardens, Clifton, Bristol, BS8 3HA, England.

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AVICULTURAL MAGAZINE



VOLUME 100
No. 2
1994

CENTENARY YEAR

THE AVICULTURAL SOCIETY

The Avicultural Society was founded in 1894 for the study of British and foreign birds in freedom and captivity. The Society is international in character, having members throughout the world.

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AVICULTURAL MAGAZINE

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EDITORIAL

Final arrangements have now been made for the two-day symposium at Bristol Zoo, which marks the Avicultural Society's Centenary Year, on Saturday and Sunday, 10th and 11th September. Council Member, Ken Lawrence, has gathered together a number of speakers who will present much practical and thought-provoking information on various aspects of aviculture in the late 20th century - as well as a nostalgic look back at the Society's history and some of the people who helped make it the internationally-respected body it is today.

But before the main programme gets underway, and following a short Reception, Members and Guests, including leading figures from the world of aviculture, will be welcomed by the Avicultural Society's President, Miss Ruth Ezra and Honorary Secretary-Treasurer, Geoffrey Greed.

Subjects to be covered during the morning session include Cranes in Aviculture (Debra Bourne, MA, VetMB, MRCVS) and Parrotlike Birds (Michael Reynolds). Subjects covered after lunch are Planted Aviaries (Raymond Sawyer), Quail and Partridges (Gary Robbins), Bird Photography (Dennis Avon, MIOp, ARPS), and Avicultural Successes at Chester Zoo (Dr. Roger Wilkinson).

During the pre-lunch session, Raymond Sawyer, will evoke memories for many older Members when he looks back over the years and talks on the subject of the History and Personalities of the Avicultural Society.

On Sunday, 11th September, following Morning Coffee, there will be a guided tour of Bristol Zoo. Afterwards, Members and Guests are asked to make their way to Rode in Somerset for an afternoon at the delightful Tropical Birds Gardens, established by the late Donald Risdon and his wife, Betty. Afternoon Tea will be served.

At an 'all-in' cost of just £17.50, the weekend represents very good value and it is only through the good offices of the Society's Bristol Zoo headquarters that Members and Guests are assured of an excellent Celebration Dinner at a cost far below that prevailing elsewhere at the present time. If Members would like guidance about hotels recommended for an overnight stay during this weekend, Margaret Ware of Bristol Zoo will be very happy to help. Telephone her on Bristol (0272) 706176.

F.W.

BREEDING THE WRINKLED HORNBILL AT PALMITOS PARK

By Rosemary Low (Gran Canaria)

The large Hornbills are among the most interesting and dramatic of bird species found in zoological collections. Because of their size, it is expensive to feed and house them, thus few are kept in private collections. In recent years, several Hornbill species which previously were little known in captivity have been imported from Asia. This is probably because logging has resulted in trappers entering new areas.

One of the Asiatic species which was imported on a few occasions during the late 1980s is the Wrinkled *Aceros corrugatus*. Apparently it is nearly extinct in Thailand, rare in Borneo and more common in Sumatra and Malaysia. Most captive birds are believed to have originated from Sumatra. This species is increasingly threatened by habitat destruction, as it inhabits lowland forests. However, not much appears to be known about it in the wild.

Adult birds can be sexed at a glance. In the male the side of the head is white, the gular (throat) pouch is white and the cheeks, neck and part of the upper breast are yellow-buff. The female's gular pouch is dark blue and her plumage is entirely black. The male's casque is mainly red and his beak is yellow and pink with the lower mandible partly brown. The female's beak and casque are yellow.

In both sexes the iris is brown and the skin surrounding the eye is bright blue. As in all the large Hornbills, the long black eyelashes are the envy of many a human female! Length of this species is about 28-30 in. (70 - 80 cm). In our two pairs at Palmitos Park, Gran Canaria, the male is noticeably larger than the female.

Both pairs resided in the breeding centre, away from the public, until 1991 when one pair was placed on exhibit. Because they were not used to the close proximity of people they had remained quite nervous. Within a month of being in the park they were very steady and soon became so tame that they did not object to visitors touching them through the welded mesh.

One day in early 1993 I saw the male chasing the female, but not aggressively. Interpreting this as a sign that he was interested in nesting, I exchanged the locations of the two pairs. Again it was interesting to observe how the nervous pair from the breeding centre soon became tamer in the park.

In February I attended a meeting at Rotterdam Zoo for participants in EEP (European Endangered Species Programmes) for several species. One of these was the Great Indian Hornbill *Buceros bicornis* of which we have one pair. Koen Brouwer, of the EEP executive office in Amsterdam, described the importance of the correct nest site for Hornbills. The entrance must be narrow and not too high; the female must be able to reach up when standing on the bottom to take the food offered by the male. There should be no perch in front of the entrance.

When I returned from the meeting I asked assistant curator Mike Gammond to modify the nest-box for our pair of Wrinkled Hornbills. But he had a better idea and offered them a log. I thought perhaps it was too small - but I was wrong. It measures 3ft. 4in (101cm.) high and 12in (31cm) wide at the widest point. At the base it is only about 8in. (20cm.) wide. There is a perfect natural entrance, neither too high not too wide.

During the last week in March I was surprised to see the female inside the log looking out, on several occasions. No courtship behaviour had been observed - but very little time can be spent in observation. In both pairs, regurgitation of a piece of fruit is often seen, perhaps as a prelude to courtship behaviour which was interrupted.

The breeding behaviour of Hornbills differs from that of all other birds. The female is sealed inside the log from just before laying until the young fledge. In the large species, this is a period of at least 14 weeks. I have often speculated on why this should be so. After all, a large bird with a fearsome beak has less need to protect itself from predators than most other bird species, yet none other practices this form of incarceration. If the reason is not for defence purposes, what can it be?

Being ignorant of Hornbill behaviour, and believing that the female might need some mud to close the nest entrance, a tray of mud was provided. I was to discover, however, that she uses the faeces from inside the nest. I also suspect, but have no proof, that it is the female who closes the entrance. In the log provided, the entrance is an irregular shape, measuring 20cm (8in) high; the width varies between 6cm and 7cm (2½ in to 3in) and 9cm in the centre. On 3rd April I found that the female was sealed inside the log, which was closed but for a slit 1.5cm (4in) wide. Almost daily one could see fresh faecal material smeared down the slide of the slit, making a smooth surface.

A wooden lid was nailed on top of the log and there was a hinged

door in the side - but for emergency use only. These were not used, however, as we had no wish to disturb the female. From a very informative paper which recorded the breeding of this species at Audubon Park Zoo (New Orleans) (Singer and Myers, 1992), the incubation period of this species is given as about 29 days and the usual clutch size as three. This zoo was the first to record breeding this Hornbill, the first success occurring in 1988.

The log for our pair is situated in the enclosed shelter of the aviary; it stands on a concrete base. While the female was nesting, the male spent most of his time in the outside flight which is 5m. (16ft.) long, 2.5m. (8ft.) wide and 2.4m. high. It is covered in self-planted weeds, one of which grew into a tree on which the Hornbills clean their bills.

The maintenance diet for these birds consists of about 90% chopped fruits (banana, grapes, guavas, apple, pear, orange). Soaked dog chow is also accepted. Crickets are refused; no other livefood was offered prior to the nesting attempt. Mice and lizards which enter the aviary are killed and eaten also, on one occasion, an unfortunate sparrow.

On 9th May, after 35 days of the female being sealed in, a chick was heard. A few days previously dog chow had been discontinued as I feared it might swell up in a small chick and prove difficult to digest. Now there was an urgent task: to find sufficient animal protein on which the chick could be reared. The female accepted food from us as readily as from the male. As he refused crickets, these were offered directly to her four times daily. She took them for the first few days but thereafter ejected them angrily, usually injuring them first. Fruit, mainly papaya and banana, was taken eagerly in almost any quantity offered. She would also take mealworms. The male relished the large kind and would have consumed unlimited quantities but he was usually given about 30 at a time. He would accept them quite gently from the hand or from a container held in the hand.

The female was hand-fed through the slit four times daily for the entire duration of the rearing period, between 9 am and 6 pm. It was time-consuming but well worth the effort, as we were confident that she was receiving sufficient food. She never refused food and she often seemed very hungry. Although the male was feeding her, I suspect he did not give enough and preferred to feed her on mice, lizards and mealworms. Two species of endemic lizards, which are extremely common, were offered live to the male. He would feed only small ones to the female, eating the large, tough ones himself.

Mice were fed, as available, especially after the chick was 30 days old, averaging about eight daily, until the chick was 50 days old, then only about two daily. They varied in size from new born to adult. The small ones were fed directly to the female, the large ones to the male. He would run them backwards and forwards through his bill, breaking all their bones, before offering them to the female. David Gammond, who did most of the hand-feeding, noted that the female became very vocal when given live mice. She would feed the small ones to the chick.

Yolks of hard-boiled eggs were also offered to the female, varying in number between two and four daily. When the chick was feathered he would sometimes try to intercept the food offered to the female but she did not permit this. I noticed, however, that she often fed yolk to the chick as I offered it, yet seldom let him take fruit. Who can say whether this was because she preferred fruit or because instinct told her the chick needed the protein?

Little could be recorded about the development of the chick, which was not seen through the slit until it was four weeks old. During the first few days of its life I sometimes wondered whether I was hearing a cricket chirping inside the log or a chick! Both made a rapid chirping sound. As the chick grew, its voice altered; it would solicit food from its mother with a rapid chirping sound. She would pass perhaps only one item in seven to it; others were no doubt regurgitated later.

As the chick grew, it was only possible to see his head clearly, a notable feature was the very light blue iris of the eye.

On 17th July, a small part of the seal of the nest entrance was broken. Next morning the female was sitting in the flight with the male. He was obviously excited to see her; I saw him jumping backwards and forwards over her on the perch. Next morning the young Hornbill was sitting on the floor of the outside flight. Later in the day he was on a low perch and there he spent the night with his father at his side. Next day, at noon, he was sitting on the ground in the full glare of the sun, panting. He made no attempt to struggle when moved to a shady place. The following day, however, he did not permit such familiarity. Next day I saw the male fly to him with food in his beak. It was not accepted, perhaps because the young one was conscious of being observed. The following day and thereafter the young Hornbill was almost invariably on the highest perch with one parent on each side. The individual distance (the space between each bird) was always the same.

According to Singler and Myers, all young resemble males on

fledging in the colour of the face and gular pouch. A feature of the plumage of our young bird which was not mentioned by them was the coloration of the shaft of the feathers of the underside of the tail. This was black, whereas in adults the shaft is white. A small area at the base and tip of the tail feathers was also black. The skin around the eye was bright blue - but not as pronounced as in adults. The casque on the upper mandible was absent. This enables one to see that Hornbills and Kingfishers are related for, without the casque, the bill is more reminiscent of that of a Kingfisher.

On fledging, the young one was equal in size to the female, or slightly larger, but with a shorter tail than that of the male. The female had emerged from the log with only one or two tail feathers. The young bird's casque developed almost imperceptibly; by the time he was six months old it was nearly as large as the female's. Only then was his sex certain, indicated by the red on the casque and lower mandible. The female's bill is entirely yellow. In contrast to the adults, the base of upper and lower mandible was black. By then, the iris of his eye was pale brown.



Rosemary Low

Male Wrinkled Hornbill

On 31st July, 14 days after she had emerged, the female was seen in the nest again. On 4th August, she started to plaster up the entrance. Two eggs were laid. However, the female deserted the nest on 13th September. One egg was infertile and the other contained an embryo which had died. At the end of September or

the beginning of October, the female laid yet again. She deserted the nest on 12th October when it was accidentally soaked by a keeper cleaning the aviary. It was then I suspected the same thing had happened on the previous occasion. The single egg was placed in an incubator. It was not known whether the embryo died before or after this but it was at an early stage of development. The nest log was then removed.

At the time of writing, the end of December, the young male remains with his parents. His rearing was the unexpected success of 1993. It provided a fascinating insight into the breeding behaviour of Hornbills. More importantly, it was one more small step in the direction of establishing this Hornbill in captivity. To date, young have been reared in few collections but with every year which passes, another collection records success. In 1992 the breeding station of Vogelpark Walsrode in Majorca was successful and at about the same time, Kuala Lumpur Zoo in Asia.

After only one season's experience with this species, it seems to me that two of the factors important for success are the provision of a box or log with a suitable entrance (not too wide and at the right height) and plenty of livefood of the size of small and adult mice and small lizards.

The larger Hornbills will never be common in aviculture. The expense of feeding and housing them means that they are mainly confined to zoological (not private) collections. However, knowledge gained from captive breeding may one day contribute to the survival of this increasingly threatened group of magnificent birds.

REFERENCE

- SINGLER, E.U. and MYERS, M.S. 1992. Breeding the Wrinkled Hornbill at the Audubon Park and Zoological Garden, *International Zoo Yearbook* 31: 147 - 153.

* * *

TOOL-USING BY PARROTS: THE PALM COCKATOO AND THE HYACINTHINE MACAW

By Paolo Bertagnolio (Rome)

Summary

Poorly known aspects of the nesting behaviour of the Palm Cockatoo *Probosciger aterrimus* in north-western New Guinea are described. The tool-using feeding behaviour reported by Wallace in 1875, is critically re-evaluated in the light of a recently discovered "natural" feeding technique in Hyacinthine Macaw *Anodorhynchus hyacinthinus*.

The usual habit of the Palm Cockatoo, which fills the bottom of the nesting cavity with a layer of interlocking fresh twigs, has been reported by various ornithologists and partially observed in captivity.

Different hypotheses have been put forward on the role of this particular substratum. It has been said it may prevent plumage soiling by the semi-liquid tarry faeces of the single chick, the flooding of the nest cavity by heavy monsonic rains, or the collapsing of the whole chamber subsequent to termite activity in a dead or partly dead tree.

During 1982 and 1983 I had the opportunity to carry out brief field observations in north-western Irian Jaya (Triton Bay area), which add to the sparse existing data on this primitive species.

Nest selection in Palm Cockatoos seems to be a rather slow process, due to the wary nature of the parrot. The first step, once an apparently suitable nesting hole has been located in a mature tree, is to select a few metres from it a couple of young trees some 10 cm. in base diameter.

After being quickly deprived of their branches, leaves and part of their bark, these small trees are truncated more or less at the level of the nest-hole. The two heavily pruned trees are then used as safe observation posts, to which the birds daily return for a number of weeks.

This behaviour had been independently observed by Dr. Soendji, senior associated ornithologist to the Ragunan Zoo, who extensively travelled through Irian Jaya and the Aru islands. He drew an explanatory sketch on letter head of the Ragunan Zoo, Jakarta (Fig.1).

The familiarity of the species with this kind of vertical perches is easily verified in captivity, and they could represent a good "natural" stimulus in order to induce the birds to breed.

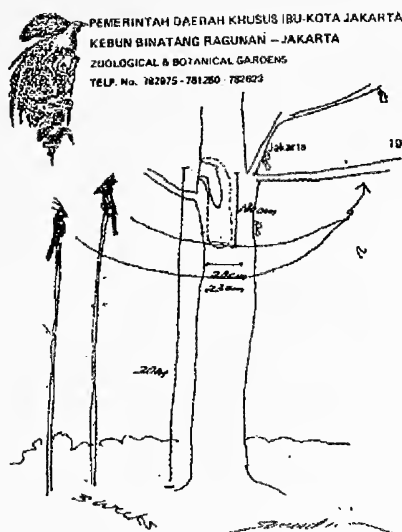


Fig.1

When the pair is definitively convinced that the area is totally safe and that the selected cavity is neither inhabited nor contended for by other birds, mammals or reptiles, the male flies onto the nearest main branch where he repeatedly stamps his foot as a territorial claim or a social or sexual message to the female (1). Soon after he starts to inspect the hole which he usually enters in an upside down position, re-emerging within seconds upright (Fig.2.).

Once a cavity is considered suitable, it is enlarged within a few days by biting off and scraping away all decayed wood. Then a number of fresh twigs, which form an interlocking layer, firmly anchored to the walls, are dropped inside.

Dr. Soendji has often found, mixed with the sticks, flight and tail feathers of large birds, such as Hornbills or Herons, as well as other

(1) In the course of my field observations I have been unable to register the tool-using drumming behaviour described in 1984 by A.C.Wood. This ornithologist, while in Iron Range, north-eastern Cape York Peninsula (Queensland, Australia), saw a male Palm Cockatoo with outstretched wings, producing a loud tapping noise by hitting a hollow branch with a stick clenched in its left foot.

vegetable scraps, the fermentation of which - he suggests - could produce heat helpful to the development of the embryo. He adds that small vertebrates, including reptiles, enter the parents' diet in the rearing period. Although this statement may look rather surprising, it can be supported by at least two personal observations of captive Palm Cockatoos at C.S.C.P. nibbling a mouse, presumably captured on the bottom of the aviary, firmly holding it in one of their claws.

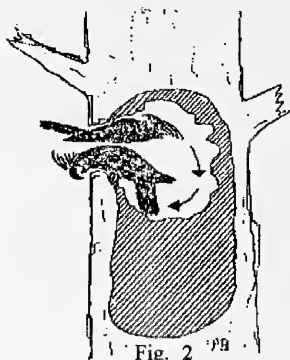


Fig. 2 '99

The way these Cockatoos peel off the bark from the big fresh branches regularly replaced in the flight as perches, may support the idea that their wild diet includes insect larvae, as in the Australian Genus *Calyptrorhynchus*.

No doubt the more interesting field observations on the Palm Cockatoo's behaviour are those from Alfred Russell Wallace, the great naturalist and explorer who, in 1857, repeatedly met with this species on the Aru Islands. I quote here from his book, *The Malay Archipelago*:

"It eats various fruits and seeds, but seems more particularly attached to the kernel of the kanary nut, which grows on a lofty forest tree *Canarium communae*, abundant in the islands where this bird is found; and the manner in which it gets at these seeds shows a correlation of structure and habits which would point out the "kanary" as its special food.

"The shell of this nut is so excessively hard that only a heavy hammer will crack it; it is somewhat triangular, and the outside is quite smooth. The manner in which the bird opens these nuts is very curious.

"Taking one endways in its bill and keeping it firm by a pressure of the tongue, it cuts a transverse notch by a lateral sawing motion of the sharpened lower mandible. This done, it takes hold of the

nut with its foot and, biting off a piece of leaf, retains it in the deep notch of the upper mandible, and again seizing the nut, which is prevented from slipping by the elastic tissue of the leaf, fixes the edge of the lower mandible in the notch, and by a powerful nip breaks off a piece of the shell.

"Again taking the nut in its claws, it inserts the very long and sharp point of the bill and picks out the kernel, which is seized hold of, morsel by morsel, by the extensive tongue. Thus every detail of form and structure in the extraordinary bill of this bird seems to have its use, and we may easily conceive that the black cockatoos have maintained themselves in competition with their more active and more numerous white allies, by their power of existing on a kind of food which no other bird is able to extract from its stone shell".

This is the first example of tool-using in a wild parrot, whereby an external object is used as a functional extension of beak or claws in the attainment of an immediate goal.

Another, more simple tool-using behaviour, has been reported by Chisholm in 1971. It refers to Rose-breasted Cockatoos or Galahs *Cacatua roseicapilla* which in New South Wales dropped stones on the iron roof of a country house, giving signs of listening for the sound as a reward. Similar bombing games are performed by Kea *Nestor notabilis* in New Zealand.

Neither the aforesaid Dr. Soendji, nor myself, were able to observe a wild Palm Cockatoo while opening a kanary nut with the technique described by Wallace. Hence, as suggested by Dr. Soendji, this could reflect a misinterpretation on the bird's behaviour. It may in fact happen that when snatching a nut the cockatoo tears off a whole branchlet with it. The accidental interposition of a leaf between the upper mandible and the fruit may have produced a false impression (Fig.3.).

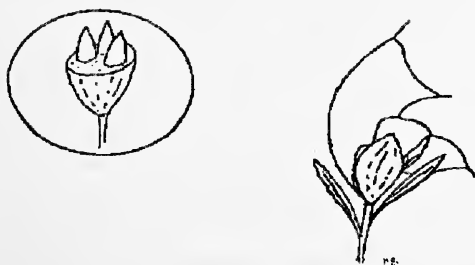


Fig.3.

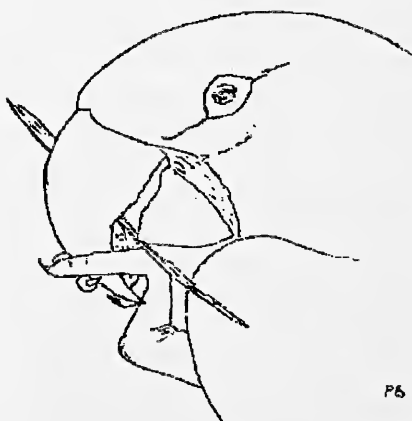
Halved Kanary Nut showing its three kernels

Palm Cockatoos at C.S.C.P. generally crack the hard-shelled Brazilian nuts *Bertholletia excelsa* by way of simple pressure, whereas almond or apricot stones are occasionally subjected to a partial transverse notching.

An indirect confirmation of the feeding technique so circumstantially described by Wallace may however come from observations recently carried out on my captive Hyacinthine Macaw *Anodorhynchus hyacinthinus*, a species whose beak structure shows a degree of convergence with the Palm Cockatoo.

Besides the usual seeds, pellets, fruits, vegetables, raw meat, etc., the diet of these parrots includes a good percentage of hazelnuts, almonds, walnuts, Brazilian nuts, peanuts and various fruit stones. Only in 1988, while offering a few particularly hard-shelled almonds (which had resisted the nut-cracker), did I have the opportunity to observe an unusual behaviour.

The male collected one of these almonds from the grassy bottom of the flight, and after a two-three seconds unsuccessful pressing attempt, he suddenly transferred it to the claw and pulled up a large grass blade in its bill. The almond was then re-seized by the beak, while the piece of grass was positioned, with the help of the tongue, on the action point of the lower mandible. After a few attempts the stone was finally broken. The same process was, within seconds, performed by the female too (Fig.4).



P5

Fig. 4

This technique is invariably adopted every time the birds are confronted with sufficiently hard almonds or nuts. When part of the kernel remains inside one half of the shell, the bird seizes it with

the tip of the upper mandible and pulls it out, morsel by morsel, with the help of the tongue, as described by Wallace. Other aspects of the feeding habit of the Hyacinthine macaw significantly diverge from those of the Palm Cockatoo, but these could be discussed in a subsequent paper.

Other than grass blades, I also had the opportunity to register different vegetables, such as willow leaves, dry or fresh couch-grass stalks, etc., being used as a tool by Hyacinthine Macaws. It is worth mentioning that the two subjects at C.S.C.P. are adult captured birds, imported separately and still rather wild.

We know that the habitat of the species, in south-western Brazil and adjacent south-eastern Bolivia, includes vast humid lands interspersed with palms (Pantanal) and that fragments of date stones have been frequently found in the stomach of shot subjects. We could therefore hypothesize that in the wild a piece of vegetable matter used by the macaws in order to reduce the slipperiness of these fruit stones (and more in general of stones freshly extracted from any juicy fruit) allowing the rim of the lower mandible to achieve a better grip. An action in some way analogous to opening the screw plug of a bottle by wrapping it in a napkin. The long oversighting of such a behaviour contrasts with the large number of Hyacinthine Macaws held in both public and private Zoos, and reflects research potential of correctly kept animals.

ACKNOWLEDGMENTS

I am grateful to Dr. Alfredo Guillet for a critical reading of the manuscript and useful suggestions, and to Dr. Soendji for his explanatory sketch reproduced on Fig.1.

REFERENCES

- BERTAGNOLIO, P., 1983. Uso di oggetti nei Pappagalli. Boll. CSCP, 4: 41 - 53.
1984. Osservazioni sulla biologia riproduttiva del Cacatua delle Palme *Probosciger aterrimus* in ambiente naturale. Boll. CSCP, 2: 1 - 6.
BOSWALL, J., 1977 Tool-using by birds and related behaviour. *Avicultural Magazine*, 83: 88 - 97, 146 - 159, 220 - 228.
1983. Tool-using and related behaviour in birds: More notes. *Avicultural Magazine*, 89: 94 - 108.
CHISHOLM, A.H. 1971. The use by birds of tools and playthings. *Victoria Naturalist*, 88: 342 - 343.
LEVINE, B. 1987. Keas *American Cage Bird Magazine*, 59(6): 25 - 28.
WALLACE, A.R. 1869. The Malay Archipelago. Macmillan & Company.
WOOD, G.A. 1984. Tool use by the Palm Cockatoo *Probosciger aterrimus* during display. *Corella*, 8: 94 - 95.

JEAN DELACOUR AND THE AVICULTURAL MAGAZINE

PART II: 1920 - 1944

Josef Lindholm III

(Keeper II Birds, Fort Worth Zoological Park)

The final contribution to the 25th volume of the *Avicultural Magazine* was the then 29-year-old Jean Delacour's letter, presented in Part I of this retrospective, announcing his acquisition of the Château de Clères. In the hindsight afforded by the passage of 75 years, it is hard to imagine a more appropriate and portentous conclusion to the magazine's first quarter century.

'I have been living here for about a fortnight, and although the park is by no means ready it is fenced all round and the first arrivals are enjoying semi-liberty. Besides some mammals there are White-necked and Stanley Cranes, Emus, a pair of Trumpeter Swans, Ross's, Pale-headed, Magellanic, Canada, Bernicle, Bar-headed and Cereopsis Geese, two dozen Falcated and Chilean Pin-tail Ducks, Specifer Peafowl, Crossoptilons, and Siamese Firebacks. It is a small beginning, but I enjoy these few birds very much.

'I expect the aviaries (outdoor and indoor) and the enclosures will be ready for June or July. Mme. Lécailier is kindly keeping a lot of rare and interesting birds for me until my installations are set up. She has now a wonderful collection, especially of Parrakeets and Parrots'.

J. Delacour (Avicultural reconstruction) Series III Vol. XI,107).

'... about two years ago I received a consignment of five Cuban Trogons, in miserable condition, in fact they they were nothing but lumps of dirty broken feathers. Three died shortly, but two recovered, moulted out, and became the most charming birds one could wish to possess. Unfortunately, one died of stoppage of the intestines from having swallowed the hard skin of some coarse grape ... My last Trogon is in the best of health, and now moulting for the second time with me. It is a very tame and sensible bird ...

'My largest outdoor aviary, which connects with a heated room, contains a fair number of Magpies, such as Acalie *Cyanocorax chrysoops* [Plush-capped Jay], Blue *C. caeruleus* [Azure Jay], San Blasian, Beechey's *Cissolopha sanblasiana* and *C. beecheyi*,

Himalayan Blue *Urocissa occipitalis*, Wandering Tree Pies *Dendrocitta rufa*, African Black *Cryptorhina* [**Ptilostomus**] *afra* [**Piapiac**]; an Australian Piping Crow; some Toucans and Hornbills, long-tailed Glossy Starlings and Mexican Rails *Aramides albiventris*; all these birds agree very well together, and make a very good show. There is never any fighting between them'.

(Some birds in my aviaries. May 1921 (Series III) Vol. XII, 68 - 70).

'Nothing is more charming than a good many birds of different sorts, running, swimming and even flying in a state of semi-liberty, and I always arrange to have a number as well as some mammals in the little part of about 40 acres, all fenced by wire-netting 8 feet high with 2 feet in the ground.'

* * *

'Cranes are, in my opinion, the best ornament to a park. I keep loose together one cock and two hen Sarus, pairs of Manchurian, White-necked, European and Blue-crowned Cranes, one Stanley and a dozen Demoiselles. So far they all agree very well together, and have not destroyed any nest in the spring, but I am very much afraid that ... after several years ... I shall have to separate some pairs ... the cock Sarus is full-winged ... he sometimes disappears and flies very high for as much as half an hour, but except on one occasion he has never alighted anywhere but in the park ... I find my Cranes never touch the trout, which are abundant in the stream and lake.'

'... Curassows and Guans ... are very nice at liberty from April to November ... at the present moment I have three Crested Guan, delightfully tame little birds, which stay most of the time on the balustrade of the terrace, three Yarreles, two Alector, one Prince Albert [**Blue-faced**], one Razor-billed, and one Salvin's Razor-bill Curassows ... The last is, I believe, quite a rare species, even in skin collections ... the great tameness of Curassows allow one to have them full-winged, as they never go away, at least not with me.

'... I also tried Parrakeets loose, which the Marquess of Tavistock very kindly gave me. A pair of Indian Ringnecks and an Alexandrine cock paired to an African Ringneck hen stayed very well, and have a nest, as far as I can ascertain ... Of a pair of Rosy Cockatoos, which were given liberty ... the cock went away after three days, but the hen is still here. She has taken a strong liking to the railway station, which is just outside the park, and spends most of her time on its roof. When a train comes in she flies to the engine, in the

smoke, and stays on it even after it has started, until it reaches a curve, about half a mile away. She then flies back to the station ...

(Birds in the park at Clères. August, 1921) (Series III) Vol. XII, 113 - 116).

'... in Martinique, where I stayed two weeks in November, and two weeks again in April, thanks to the kind hospitality of the Governor, I could visit all points of interest in the island ...

'The commonest bird of Martinique is the so-called "Blackbird" (Merle) ... The males are glossy black; the females and young dark brown ... A feature of these birds is their quaint and pretty call, which can hardly be termed a song, and their boat-shaped tail ... I brought home two pairs of [these] ... *Quisqualus* [sic][*niger*] *inflexirostris* ... they now live in an outdoor aviary, where I hope to breed them...

'Another very common bird ... is the charming Quit or Sugar-bird (*Coereba* [*flaveola*] *martinicana*, locally called "Sucrier"... The Martinique Quit is almost entirely black, with yellow underparts, and, according to age, yellow or cream-white eyebrows; the base of the bill is red. They are easily caught and live well on the usual mixture of Mellin's food, honey, and milk, and insectile food... I now have eight of the active and bright little birds in perfect plumage. I landed nine and lost half a dozen on the way to Europe... As my late friend the Marquis de Siegur had brought the three species [of Martinican Hummingbirds] to France in 1914 I did not try to capture any, as I preferred to import Guiana Hummingbirds. Two species of Seed-eaters are plentiful in Martinique - the Grey Finch (*Euethia* [*Tiaris*] *bicolor* called "Cici", and the Red-throated Finch (*Loxigilla noctis*). Both are easy to catch but difficult to keep at first. I landed only one male Cici, a very small grey bird, with almost black head and breast, and five Red-throated Finches, one adult male and four young ones... There is ... a very nice song-bird of the Tyrant family (*Elainea martinicana*) [sic] called "Siffleur", a plain grey bird with a crest, most charming in shape and character. Several young ones were brought to me, but only one survived; it unfortunately died in a fit one month after its arrival in France. A Grey Thrush (*Cichlherminia herminieri*) also died soon after it reached Europe...

'My collection of live Martinique birds was completed by a pair of Passerine Doves (*Columbala* [*Columbina*] *passerina*) and nine Martinique Doves (*Zenaida* [*aurita*] *martinicana* ...

'A very interesting fact, so far never recorded in any work on

ornithology, is the migration through Martinique of the Guiana Parrotlet (*Psittacula [Forpus] passerinus*). These little birds arrive from the north in February and March as a rule, and remain three to four weeks in the island. I was fortunate enough to see several flocks of them and to bring home a pair caught near Fort-de-France. They are typical *P. passerina*...

'There are in Martinique many other interesting birds that one would be glad to have in aviaries, but owing to their scarcity I would not capture them. As an instance, let me mention some charming hours I spent one afternoon in a wood of giant tree ferns on the slope of "Montagne Pelie". One remembers that twenty years ago this awful volcano destroyed the city of St. Pierre and its suburbs, causing in three seconds the death of all 40,000 inhabitants. Now everything is quiet again, and the tree ferns which have grown since the eruption are some 30 feet high, so rich is the vegetation in the West Indies. A family of birds inhabited the tree fern wood: a pair and three young Clarinos (*Myiodesetes genibarbis*) or "Siffleurs de Montagne". The Martinique species is, I believe, superior to all others in beauty and song... These birds only live on the hills, above an altitude of 1,000 feet. The five Clarinos were sitting in the shade, sometimes flying to catch an insect... It was a wonderful sight, these handsome birds in the stately tree ferns; but more beautiful still was their concert. The male was singing all the time, and the young ones joining him now and then; I had never heard before such a melodious and pure voice. Its own song is most varied, but the Clarino still mimics perfectly human whistling; I tried Arpeges, and other tunes, which he answered perfectly at once. The memory of the time I spent with these lovely birds, which were fearlessly flying and roosting around me, is the best souvenir I brought back from the West Indies'.

(Notes on field ornithology and aviculture in Tropical America I. Martinique. July, 1922 (Series III) Vol. XIII, 101 - 105.)

'The journey down the Rio Portuguesa and the Apure, in a launch, is wonderful... Here, hundreds of Black Vultures and Caracaras are feeding on the carcase of a reptile; there are also various Egrets and other Herons, thousands of Terns and Cormorants. On most of the trees overhanging the water Hoatzins are sitting or moving along the branches, while enormous iguanas come down to drink... Over our heads hundreds of large birds are soaring: huge American Adjutants and *Tantalus* {**Wood Storks**} are especially numerous; Maguari Storks, *Aramus*, all sorts of

Hérons, Scarlet and Glossy Ibises, Roseate Spoonbills; ... Ospreys are fishing around the launch, and it is a wonderful sight...

'San Fernando is a miserable and unhealthy little town, frightfully hot. I was there the guest of the Lancashire General Investment Trust, whose officers were most kind to me... The comfortable bungalow faces the Apure; from the windows we could see enormous Crocodiles and Freshwater Dolphins ... and on the sand bank, half a mile distant, colonies of Terns, mainly of the curious *Rhynchops*, made an awful and objectionable noise day and night...

'We left San Fernando, taking with us a Ford lorry to carry our live animals; Agoutis (of the new species that I have described as *Dasyprocta apurensis*), Tiger Cats, Capybaras, Parrots, Macaws and Parrakeets, Curassows and Guans, King Vulture, Adjutant Storks, Tree-ducks, Orinoco Geese, Owls, Sun-bitterns, Purple Gallinules, Snake Birds, Jacanas. At Camoguans we took the small birds we had left behind; Black-cheeked Cardinals, Tanagers, Parrakeets, etc... At Caracas we took the birds we had left... We sailed for Trinidad with that menagerie on 1st January...

'...we have something new: the Motmot of Trinidad... A kindly aviculturist, who brought up one of these birds from the nest, most generously offered it to me. A delightful present, for the Motmot of Trinidad, peculiar to that island, had never been brought to Europe. it is decidedly smaller, more brilliantly coloured and more elegant in form than the ordinary species of the Continent *Momotus momota*.

'We embarked on 15th January, on the little French steamer *l'Antilles*, with our menagerie slightly diminished by a few losses and only augmented by the Motmot. Some of the mammals and larger birds ... were left behind, thanks to the kindness of the French Consul, who took care of them until my return'.

* * *

'People have a preconceived idea that St. Laurent, the town of the convicts, is a "God-forsaken and terrible place". What a mistake! ...The Director of the Administration came to see me on the quay; he placed at my disposal a fine and spacious house, surrounded with outbuildings which served admirably for the installation of my collection. With the aid of the convicts, who were given to us as servants, we quickly settled in. We arranged a laboratory, bird-rooms, aviaries and enclosures. Our greatest help was an old convict, the guardian of the house, who gave me many proofs of his goodwill. His Picardy accent drew my attention, and I soon discovered that he came from Villar-Bretonneux, my own

village of the Somme; he knew my grandfather, and after 35 years of exile he was quite overcome at seeing a member of my family. His crime, a small burglary - a very light one compared with those of most of his comrades, had been augmented by his many attempts at escape... During all my stay there, this man proved himself absolutely dependable.

'After having installed the Venezuelan livestock that we had brought with us, we occupied ourselves in procuring Guiana species. I engaged some liberated convicts who make it their profession to catch birds to sell skins: they use blowpipes with wonderful skill; in addition to that, I provided them with traps... Every day they brought me in something they had captured, which my assistant, Mr. F. Fooks looked after'...

(Notes of a bird-lover in Tropical America. October, 1922 (Series III) Vol. XIII, 148 - 157.)

'It is no easy matter to accustom the feathered inhabitants of the tropical jungle to captivity. Certain species are very refractory; at different times we attempted to keep Jacamars and Manakins in cages, but without success. Some lived for a few days, others a few weeks, appearing to become accustomed to the food, only to succumb in the end...

'...our most interesting experience was with the Humming-birds. These wonderful little things were all caught with the aid of blow-pipe loaded with pellets of soft earth ... and were almost always brought to me in an unconscious state. We then held them in our hands to revive them and make them feed. They were fed upon a mixture of Mellin's food, milk and honey, which was sometimes substituted by phosphatine in place of the Mellin's... We found that it was necessary to catch the birds in the morning so that they had the rest of the day in which to recuperate, for Humming-birds caught in the evening died more frequently. Usually they will feed by themselves between four and six hours after their capture... Thanks to constant attention we did not lose more than ten per cent of our Humming-birds, and on leaving St. Laurent we took with us thirty birds representing the following species: *Topaza pella*, *Camplopterus largipennis*, *Florisuga mellivora*, and *Thalurania furcata*, the two latter being the most numerous... My collection was further increased by Tinamous (*Crypturus soui*), Grey-fronted Doves (*Leptoptila rufaxilla*), Cayenne Rails (*Cresciscus cayennis*), various Macaws, Jacarini Finches and other little seed-eaters, Saltators, Quit-quits, and many

Tanagers, not to mention some mammals.

'The animals and birds rested at St. Laurent with my other collections under the care of Mr. Fooks, whilst I visited Suriname and Demerara and went to spend a week with Mr. Beebe at the Tropical Research Station of Kartobo (British Guiana), and I rejoined my collection on board the steamer *Antilles* when I re-embarked three weeks later at Georgetown (Demerara) for Trinidad and Martinique'.

(Notes of a Bird-lover in Tropical America. November, 1922. (Series III) Vol. XIII, 161 - 168.)

'In the spring a few Cranes were added to my collection; three white Asiatic and three European, sent from Calcutta by Mr. David Ezra; a pair of Crown Cranes from Sudan, through the London Zoological Society; these, *Balearica ceciliae* are very similar to ordinary West African Crown Crane, but rather smaller, darker, and with redder cheeks.

'Ducks have done fairly well ... over one hundred were bred, including ... White-faced Tree Ducks ... bred for the first time in France... The Ashy-headed Geese have reared four young ones this year, which brings my little flock ... up to eleven. I have exchanged them with the Duke of Bedford so that our birds do not become too much inbred. Some nice Ducks came to me during the year ... above all, a delightful pair of Cotton Teal, the only ones in Europe, since those Mr. Astley kept for some nine years have disappeared. They have quite settled down in an aviary. From Abyssinia I received a curious pair of Yellow-billed Ducks; they are decidedly smaller, darker and less mottled than the South African bird and I think belong to some undescribed subspecies. I intend to make it clear as soon as I can.

'In October I shall leave for the East, and after some weeks in India, Ceylon and the Malay States I hope to begin collecting birds in the wilderness of North Annam'...

(The birds at Clères in 1923. October, 1923 (Series IV), Vol. 1, 223 - 227.)

'I have just left Calcutta ... I spent two very busy days with Mr. David Ezra... His garden is crowded with birds. In the centre is a lawn where he keeps antelopes and giant tortoises, as well as deer, etc.; and there too the different Cranes and Peafowl are allowed to exercise twice a day, which are otherwise kept in small paddocks or aviaries. His collection includes... Diana, Long-nosed and

Golden Rhesus Monkeys... In two bird-rooms and in the house and verandah there are Birds of Paradise in *wonderful* condition: two Twelve-wired, one Red, one Lesser and two young Greater Paradise Birds; a lot of Macaws and Cockatoos, the best being a Lear's and a Hyacinthine.

'There is in Calcutta a very rich Hindu (Mr. Kumar Gitendro Mullick), who has quite a fine collection ... several Paradise Birds in cages (Twelve-wired and Red) ... and an excellent collection of Parrots (about 200), the best of them being several Moluccan and Leadbeater Cockatoos, one yellow and one *blue* Rock Parrot (Alexandrine), one Pesquet's Parrot, one Hawk-headed, and a Lear's Macaw. In the garden, where he has beautiful aviaries, he keeps eight White Asiatic Cranes, one Manchurian, Demoiselles, Sarus and European, as well as Jabirus, Adjutants, and other Storks, and also Pelicans... He most kindly presented me with a pair of Argus Pheasants and a pair of Crowned Pigeons.

'The Calcutta Zoological Garden is very good. In addition to fine mammals, there are two male Pink-headed Ducks, lots of Cotton Teal, good Fireback and Argus Pheasants, and some Paradise Birds. Also one Lear's Macaw and a beautiful pair of Shining Parrakeets (*Pyrrhulopsis* [*Prosopieia*] *splendens*)... The bird shops and the bird market are the best I have ever seen... However, as I cannot buy much on my way out, I only took some Rain Quails, Zebra Doves and *Perdica asiatica* [**Jungle Bush Quail**] at tenpence each!

'I also bought in Calcutta three pairs of Crowned Pigeons; Common, Victoria and Sclater's... [**and**] a wonderful Bee-eater, as large as a Roller, all green, with a turquoise blue "beard"; I cannot remember its name, so please look it up...'

(Indian bird notes) February, 1924 (Series IV), Vol II, 30 - 32.)

'...on my last collecting-trip in Annam and some other parts of Indo-China ... my main object was to gather specimens of skins and to watch birds' habits in their natural surrounding. Nevertheless, I brought back a good many live birds.

'On 19th June, I arrived at Marseilles with heaps of cages and crates, and, owing to the efficiency of the Museum Agents, all the animals and birds were in the Jardin des Plantes, in Paris, on the 21st. Many stayed there, as they were intended to, and the others found their way to Clères one day later.

'As might be expected from a country such as Annam, which is

very rich in Pheasants, my collection of these birds was an important one, though the importation of live *Reinhardtius*, the wonderful Argus Pheasant of Annam, was an entire failure. Over seventy of these beautiful birds were collected, and did well in aviaries for months, when an outbreak of diphtheric roup slowly killed all of them. I embarked about forty, eleven of which were still alive and landed at the end of June; but in spite of all care, they died one after the other. I hope to be more lucky next year.

'The disappointment with the *Reinhardtius* was compensated for by better luck with the very rare Edwards' Pheasant ... of Annam, which was only known before my expedition by four skins in the Paris Museum. I brought over alive fourteen of these lovely birds; four pairs and one extra cock are in the best of health at Clères, while the other odd cocks, with Swinhoe's Pheasant wives, are in the collections of Mme. Lécailier, Professor Ghigi, and London and Paris Museum Zoos...

'A greater success still is the importation of one pair of a new species allied to the above, which I have just found in Annam, on the north of Edwards' Pheasant's range. It is a larger bird of the same general blue colour, but with a black crest and a longer and more curved tail. The female is lighter in colour and larger than the Edwards' hen.

'I also brought three pairs and four odd cocks of Bel's Pheasant, which looks much like a dark Silver. They are not the first imported ..., as one cock lived for some years in Paris. I have kept the pairs and presented cocks to the Paris and London Zoos and to Mme. Lécailier.

'Of other Pheasants, I had twenty Crestless, one Noble and fifteen Siamese Firebacks, two Chinquis and two Germain's *Polyplectrons*, five *Bankhiva* and one Javan Junglefowl and two *Specifer* Peafowls.

'From Calcutta, Mr. David Ezra had sent me in the spring Argus, *Polyplectron* and Kaleege Pheasants.

'The Waders consisted of five Black-headed Ibises, one Tantalus, two Epiiscopal Storks, two Greater and two Lesser Egrets, one Intermediate Egret (*Mesophoyx*), two Eastern Purple Herons ..., one Bacchus Bittern (*Ardeola bacchus*), and seven Edwards' Porphyrios, all presented to the Paris Museum; there were also one Eastern Plover (*Charadrius fulvus*), one Striated Rail (*Hypotaenidia striata*), one pair of Eastern Sarus Cranes (*Antigone sharpei*) [sic], and one pair of Black-necked Cranes (*Grus nigricollis*) which I kept.

'Both specie of Cranes are most interesting; the Eastern Sarus have been very seldom imported, while the Black-necked had never been seen in Europe before. It is a migratory bird, breeding in Thibet and wintering in Tonking where I found it ...

'Another curious bird which attracts public attention is the White-bellied Booby (*Sula sula*). It was caught by a deck steward on the sea between Saigon and Singapore. I was very doubtful whether I could succeed in getting it to live. I put it in a cage and crammed it with fish and meat; to my astonishment it thrived, but never fed by itself during the sea journey. However, it got very tame in Paris; it fed at once on fish and meat and is in perfect health ...

(A consignment of Eastern birds. November, 1924 (Series IV), Vol. II, 293 - 296.)

'During the thirty years that Mr. Astley kept birds very many extremely rare kinds lived in his aviaries; ... a Blue-bellied Parrot (*Triclaria cyanogaster*) from South-east Brazil ... lived many years in captivity and ended its days in the Zoological Gardens of London. Mr. Astley possessed many other Parrakeets, and was the first to breed the Queen Alexandra's (*Polytelis alexandrae*) and the Golden-shouldered Parrakeets (*Psephotus dissimilis*); he likewise bred Pileated Parrakeets (*Porphyrocephalus spurius*), Stanleys, Many-colours, etc. He owned a Lear's Macaw, a *Pachynus* [*Graydidascalus*] *brachyurus*, a *Microglossus*, and Solitary Lories from Fiji...

'His collection of Doves was very good, also that of the Water-fowl, of these he kept for seven years Cotton Teal (*Nettapus*), and was the only person alive to keep them so long. He had many Waders too, particularly *Agamia* [**Agami Heron**] and *Thinocorus* [**Seed-snipe**] ... He always kept many Cranes, and a young Australian Crane was reared at Brinsop in 1924.

'He was the first in Europe to rear the Pink-breasted Grosbeak and Orange-headed Ground Thrush, and in his aviaries Shamas, Blue Robins, American Robins, Crimson Finches, Cuban Colins [**Bobwhites**], and others bred freely.

(The late Mr. Hubert Astley. October 1925 Seres IV), Vol. III, 279 - 280.)

'... Colies [**Mousebirds**] are entirely fruit eaters and do very well in confinement on the ordinary diet of such birds. But they are timid, stupid and dirty, and are not interesting in spite of their

shape and curious habits. They are fairly often imported...

(The Colies November, 1925 Series IV), Vol. III, 279 - 280)

Those who knew him were well aware that Dr. Delacour thoroughly enjoyed the effects of such pronouncements upon those who heard or read them.

'There are perhaps birds of more magnificent plumage than the Touracos, but to my mind none more entirely desirable; most of them possess all the qualities which one requires in an aviary bird. Their shape is perfect, their plumage enchanting; their character tame and gentle; they live long without special care and, with me at any rate, breed freely. I own that Touracos are the birds which I like best of all'...

* * *

'In my opinion the peculiar Hoatzin (*Opisthocomus hoazin*) ... is related to the Touracous, to whom it bears a faint resemblance, although it is heavy, awkward and slow... I had the opportunity of seeing Hoatzins at close quarters on the Apure in Venezuela, and in Guiana, and they really are most curious birds, not timid. Mr. Beebe, who has made a close study of them, considers them ugly and grotesque. I, on the contrary, think they are curious, even handsome. No living Hoatzin has yet reached Europe, but their importation is not impossible, for individuals have lived in confinement in British Guiana, fed at first on different kinds of leaves and then on lettuce and cabbage, which they eat readily and which suits them very well.

(Touracous November, 1925 (Series IV) Vol. III, 284 - 290.)

It was only in the 1980s that Dr. C. G. Sibley's work with egg-white proteins established that Hoatzins are indeed allied to Touracos, rather than being Galliformes, as has been the convention.

The preceding two excerpts are offered as examples for the 40 articles written by Dr. Delacour, and a further 18 co-authored with various person, from 1923 to 1931 (Gibbard, 1988), published in both the Avicultural Magazine and l'Oiseau. With articles by a number of other British and French aviculturists, these became the book Aviculture (Seth-Smith & Pocock, 1923) a standard text for years, well-illustrated, and now a valued collector's item. In total, the articles written for this project, to a considerable extent initiated by Delacour, covered a major proportion of the birds maintained in British and Continental aviculture to that time.

'The greatest success was the first breeding in Europe of the rare

Pheasants which I brought from Indo-China in 1924. Out of three pairs only one of Edwards' Pheasants bred, laying three clutches... The rare Imperial Pheasants gave three young ones, but two met with accident, and only one, a female, was reared. The incubation period is of twenty-five days. The two pairs of Bel's Pheasants gave three and two clutches, and five pairs were reared. It is a very scarce bird in its natural haunts, only found on a few higher hills over 5,000 feet of altitude. It is darker and finer than the Silver, and just as hardy and robust. It had been bred before in the Paris Museum menagerie, from the type specimen, between 1898 and 1903, but none surviving after 1913. It has never figured in any other public or private collections. My Argus, although in perfect condition, stupidly laid in the winter, and the eggs proved unfertile. Different Firebacks - Bornean (*nobilis*), Vieillot's, Crestless - have not laid yet, but I have good acclimatized pairs which ought to breed next season. A very interesting new race, of which a pair has been sent to me by my friend, Professor A. Ghigi, of Bologna, has been named by him after me, *Lophura sumatrana delacouri*; it resembles in every way the Bornean bird (*L. ignita*), but shows the pure white central tail feathers of the Vieillot's (*L. rufa*)...

'Interesting additions to the Duck collection have been Eiders and Cotton Teal; two pinioned pairs of the latter are now on the lake ... 'I have recently received Great Bustards from Spain, through the kind help of Captain and Mrs. R. Paget, and they make a very valuable and long-desired addition to the bird collection.'

(Bird Breeding at Clères in 1925. December, 1925 (Series IV) Vol.III. 320 -325.)

'Many of our members may have been surprised that no descriptions of our present President's beautiful aviaries and enclosures have appeared yet in the magazine. The reason is that Mr. Alfred Exra, being continually building new ones and extending his collections, it is rather a difficult task to give an account of them that will not be out of date at the time it is published ...

'... a bird room has been arranged in a small building ... a very pretty and light aviary, all built of wire and iron (which used to be the home of many Sunbirds and Hummingbirds in Mr. Ezra's London flat, some years ago), stands in the centre.

'This aviary contains a fine series of birds: three Royal Starlings, one pair of Swift Parrakeets, one Indian Pitta, one Yellow-fronted Woodpecker (*Melanerpes flavifrons*), two Black-headed Yellow Bulbuls, and two White-shouldered Bush-chats (*Thamnolaea*

cinnamomeiventris) ...

'The collection of Parrakeets is most interesting; there are wonderful Lutinos, three young Blossom-heads, 10 Ring-neck, all with pink eyes, one semi-lutino male Ring-neck, of a pale yellowish-green, one male Malabar, one male Layard's, two Long-tailed; one Tabuan, and one Taviuni, one Rock Peplar, and a pair of Eclectus (*E. roratus*).

'Other Parrakeets are to be seen in a series of movable aviaries in the park ... above all, a wonderful pair of Alexandrines, the male light-blue and the female pure yellow ...

'At some distance from the Parrakeet's aviaries ... with an enclosure ... of some 16 acres, partly wooded and partly covered with heather, brush and grass, all surrounded by a high fence ... There live many mammals ... Birds are represented by eight Sarus Cranes (four of which are full-winged ...), seven Demoiselle, and four Black-crowned Cranes; some forty Chukar Partridges, Golden and Amberst Pheasants, Monals and Australian Brush Turkeys.

'We now come to the aviaries proper ... The first group ... consists ... of a building ... divided into nine compartments ... The first one is used as a kitchen and a store ... while the other eight constitute the shelters ...[and] correspond with eight outdoor aviaries.

'... birds which inhabited the aviaries in October, 1925 ... [include, among others] Blue-headed Ground Pigeons (*Starnoenas cyanocephala*) ... Ruffs, Tri-coloured Spreos ... Martinique Grackles ... Annamese Partridges (*Tropicoperdix merlini*), Grey-headed Ground Pigeons (*Geotrygon caniceps*) ... Pink-headed Ducks, Roulrouls, Harlequin Quails, Cuban Quails ... Cuban Partridge Pigeons (*Geotrygon chrysia*), Australian Catbirds, American Robins, Superb Spreos ... two pairs of Donaldson's Touracous ... Senegal Touracous, Brown-cheeked Jay Thrushes (*Dryonastes lugens*) ... Blue Robins, Blue-fronted Redstart (*Ruticilla frontalis*), Black-cheeked Cardinals and Grenadier Weavers ...'

(The birds at Foxwarren Park. February, 1926 (Series IV) Vol. IV, 37 - 41.)

'Sir, - Although I fear that the following notes may not be of interest to certain members of the Society as they do not apply to the species commonly kept in English aviaries, I am venturing to send you a list of the birds which I sent home from Indo-China, Japan and America, and which are now flourishing in my aviaries.

'From Indo-China: 7 Rheinardt's Argus Pheasants (*Rheinardtius*

ocellatus), 1 Siamese Fireback, 8 Specifer peafowl, 3 Nicobar Pigeons, 5 Long-tailed Doves (*Macropygia leptogrammica*) 1 Eastern Sarus Crane, 2 Renault's Ground Cuckoos (*Carpococcyx renauldi*), 3 White-bellied Cissas (*Cissa hypoleuca*).

'From Japan: 3 pairs of Copper Pheasants, 1 male Ijima Copper Pheasant, 3 pairs of Green Japanese Pheasants, 1 Chinese Spot-billed Duck, 4 Japanese Blue Magpies, 1 Jap. Bullfinch, 3 Yellow-throated Buntings (*Emberiza elegans*), 2 Jap. Meadow-buntings (*E. cipiopsis*), 1 Jap. Blue Flycatcher (*Cyanoptila*), 7 Jap. Zosterops, 5 Varied Tits, 3 Loo-Choo Robins, 3 Jap. Robins.

'From America: 1 pair Hutchin's [**Canada**] Geese, 1 pair Least Geese (*Branta minima*), 1 pair Blue Snow Geese, 4 South American Comb Ducks, 1 female Orinoco Goose, 1 pair Canvas Backed Ducks, 1 male Rose-breasted Grosbeak, 1 pair Blue Birds, 1 pair Baltimore Orioles. The last six birds were kindly presented to me by the Zoological Society of New York, as well as a fine pair of Kangaroos.

'Although I had already brought some Rheinardt's Argus in 1924, which arrived in miserable condition and soon died, the present birds in my collection are the first to live in good health in Europe ... The very rare Renault's Ground Cuckoo, which is only represented by half a dozen specimens in the museums of the world (London and Paris), one which I gave last year to Lord Rothschild, is a notable addition to aviculture. My friend and associate aviculturist in Indo-China, M.P. Jabouille, now has seven more in our aviaries at Hui [sic]. We have also there ... three Elliott's Pittas which, up to this year, had only been known through the two ... type-specimens in the Paris Museum, and which we were fortunate enough to rediscover... It is a gorgeous bird ... I hope to import some alive on the return from my next trip. M. Jabouille has also live specimens of the Annamese Pitta, a big brown bird, with a greenish back. The White-bellied Cissa is also imported for the first time and is a rare species. All the Japanese birds, most of them so rare in Europe, were either presented or procured by my Japanese friends Prince Taka-Tsukasa, Dr. N. Kuroda, M. Matsunaga and F. Mitsui, whose kindness to me during my visit ... I cannot acknowledge sufficiently. All these birds will remain in my collection or that of my friend, Mr. A. Ezra.'

(M. Delacour's new birds July, 1926 (Series IV, Vol. IV, 194 - 195.)

'... Manchurian Cranes are very numerous and highly prized. I

may have seen quite one hundred kept in different places ... Their value, however, is perhaps even higher than it is in Europe, as they are so much sought after. Most of the birds, if not all, are bred in captivity in Japan, and I was astonished to find that it was quite an easy undertaking. Pairs are kept in quite small enclosures, with little water ... Fertility of eggs increases with the age of the birds. White-necked and Hooded Cranes ... are also to be seen, but they are much less popular and valuable. Imported Sarus, Demoiselle and Common Cranes are often offered. White Asiatics are rare' ...

* * *

'Small birds, however, are the favourites with the Japanese, who can keep and breed them perhaps better than any other people. Both insectivorous and seed-eating birds seem to thrive as well, if not better than in any other country.

'... Japanese cages are simply wonderful; whether they are open bamboo cages or breeding-box cages, they are always pretty and most beautifully constructed. In comparison, our best cages look desperately coarse, unfinished and tasteless ... Open bamboo cages generally rest on a pretty lacquered tray, from which they remain separated by a movable barred bottom. For each cage there is a special case, into which it can be put at night ... The usual inmates ... are the lovely Loo Choo and Japanese Robins, Blue Flycatchers (*Cyanoptila*), Zosterops, various Tits and Thrushes, Redstarts, Bush Warblers, Buntings, Orioles, Jays and Magpies, etc. Higher cages are used for Larks. All these native birds are easily obtainable and commonly kept. Foreign birds are treated in the same way; among them, many rare species from Formosa can be found. Malayan and Chinese birds are the most abundant on the market, where a good many South American and some East African birds can also be obtained. European, North American and West African birds are extremely scarce.

'Box cages of a special model are used as breeding cages for some kinds of seed-eaters ... Hundreds of breeders exist nowadays all around the Inner Sea, and especially in Osaka ... Each breeding establishment consists of several hundred box-cages, arranged in four or five rows on the top of one another, under some small wooden hut or corridor with a glass front. Each cage is devoted to one pair of birds ... While Canaries and Javas reared their own progeny, all the eggs from the Australian Finches are given to the Bengalese ... Gouldian, Long-tailed, Masked, Parson, Bichenos and Cherry Finches are bred every year by the thousand. A man I visited in April had already reared 200 young Gouldians since the

beginning of the year ... In spite of the large numbers thus reared in Japan, Australian Finches still fetch very high prices, higher than ours, so great is the local demand ... the uniform food supplied to seed-eaters consists of various seeds, green food and a very good mixture, which I highly recommend; white millet immersed in raw yolk of egg, which all birds eat readily; it is very easy to make and keeps for two days.

'In Japan all insectivorous birds, native and foreign, are fed on the same mixture, composed of ground husk of rice and rice itself, salad and fish-meal ... I sincerely believe that this food is the best of all such artificial foods ... One must bear in mind, of course, that no live insects are given in Japan, except in the case of moult or illness: mealworms are not obtainable. Consequently birds thrive on the artificial food and on it only ... all there is to do is moisten it.

(Japanese Aviculture August, 1926. (Series IV), Vol.IV, 213 - 218.)

'There are three important Zoos in Japan ... among their possessions I noticed the following: - At Tokyo - Formosan Occipital Pies (*Urocissa careulea*), Japanese Storks ... Formosan Sibilias (*Lioptila auricularis*), Alcippe (*A. morrissoni*) ... Yucatan and Pileated Jays, Roulrouls, Manchurian, White-necked, Hooded, Australian and Black-necked Cranes, European and Australian Pelicans, beautiful Pelagic Sea Eagles ... At Osaka - Manchurian, White-necked, Demoiselle, Sarus, Common, Hooded and White Asiatic Cranes, Japanese Storks ... Philippine Pelican ... Giant Barbet, small Japanese Woodpecker (*Iyngipicus*), Cuckoo, Mexican Toucans, Pelagic Sea Eagles ... At. Kyoto - European Pelicans, Manchurian, White-necked, Sarus, Common, Demoiselle and Hooded Cranes, a Condor, various Sea Eagles.

'... Prince Taka-Tsukasa, who visited Europe last year and is well known to many of us, keeps a large number of birds in his garden in Tokyo ... Guiana Parrotlets breed freely ... I had the pleasure of bringing safely from Indo-China a fine male Rheinardt's Argus Pheasant, Edwards' Pheasants, Siamese Firebacks, Tantalus and Episcopal Storks, Black-headed Ibises and Edward's Porphyrios, which now are all in Prince Taka-Tsukasa's collection ...

'Dr. N. Kuroda, the well-known ornithologist ... is also a keen aviculturist. A small part of the large pond in the garden has been covered with a very large aviary, devoted to Waterfowl, of which there are about one hundred ... All the native Ducks and even an

American Wigeon drake have been captured on Dr. Kuroda's duck-hunting ground ... In a courtyard close to the garden and on the way to the museum, there are many aviaries and a bird-room. The jewels are three males and one female of the fine Mikado Pheasant ... that has quite disappeared from European aviaries, and as the Government rightly prohibits the capture of this rare bird the only chance we have of ever seeing it again in our countries lies in Dr. Kuroda's future success with his birds and new ones he may obtain through an official permission.

'There are also ... two species of Godwits, Turnstones ... Gulls (*Larus crassirostris*), a beautiful rare Lory (*Eos rubiginosus*) ... Japanese Robins and 'Nightingales' (*Horornis c. cantans*) and *H.c. canturians*, Suthoras [**Webb's Crow-Tits**] ... and different seed-eating birds.

'Marquis Yamashina also owns very nice aviaries and is mostly interested in Waxbills and other small birds ... there is one suite of eight and another of five small aviaries, with roomy houses, each one for a pair of birds. I noticed among others Diamond Sparrows, Sydney and Crimson-rumped Waxbills (*Estrilda rhodopyga*) with nests and young, three birds which do not breed in cages ...

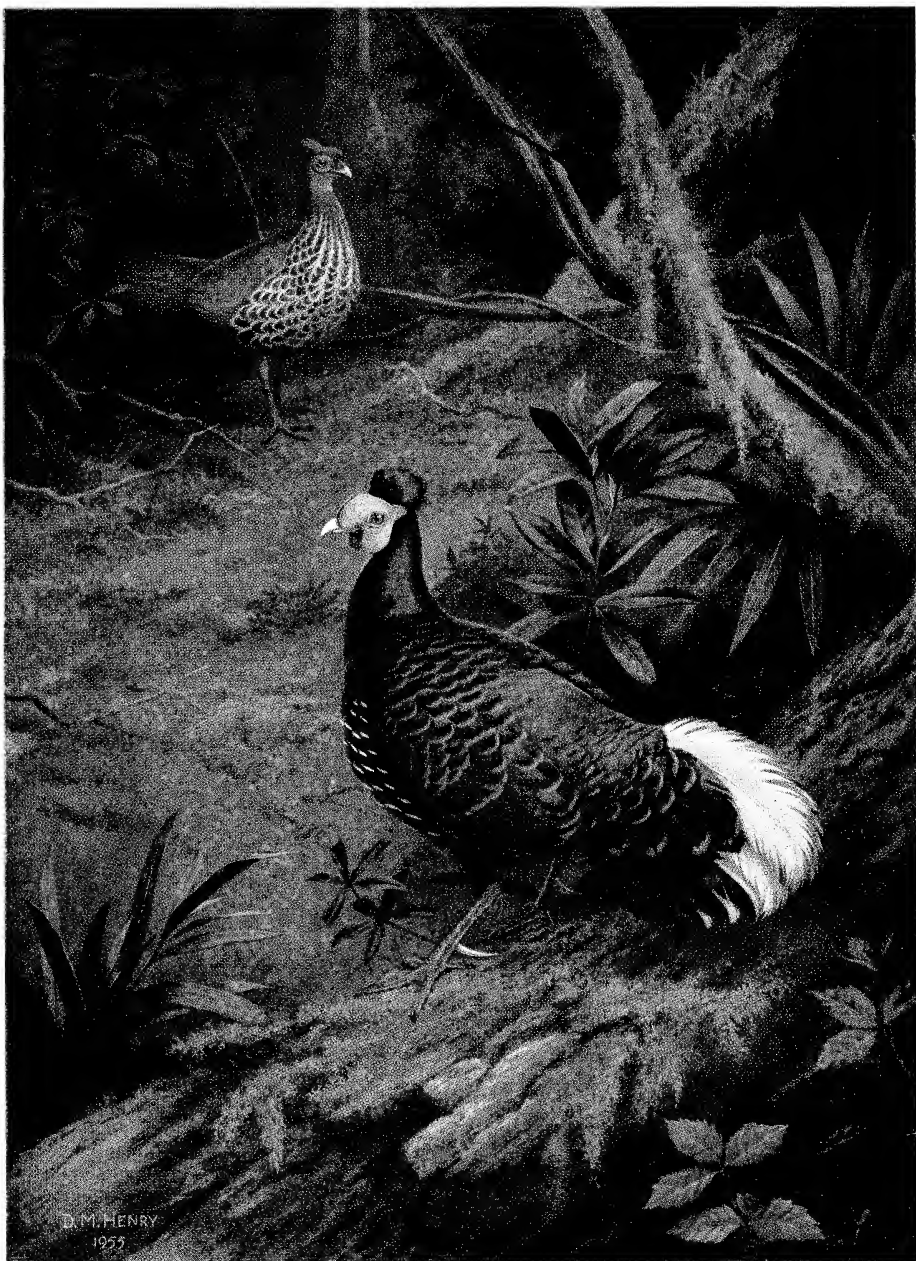
'The city of Osaka ... has over one hundred bird shops, fifty of which have been started within the last two years; it shows plainly that aviculture is rapidly increasing in the country ... I hope the above notes will show to many of us, who may think that we are the only good aviculturists in the world, that our Japanese friends have not much to learn from us, and our members should do their best to keep pace with such enthusiastic bird-lovers'.

(Japanese Aviculture September, 1926 (Series IV), Vol. IV, 247 - 253.)

'The pair of Argus three years at Clères have so far laid five eggs and there are five young, respectively five, three and one week old. Also Imperial, Edwards', Elliott's, Crestless Firebacks, Crossoptilons, Bel's Black-crested, Horsfield's Kaliy [**sic**] and six Cabot's Tragopans [**have hatched**].'

(Mons. Delacour's collection July, 1927 (Series IV), Vol. V 203.)

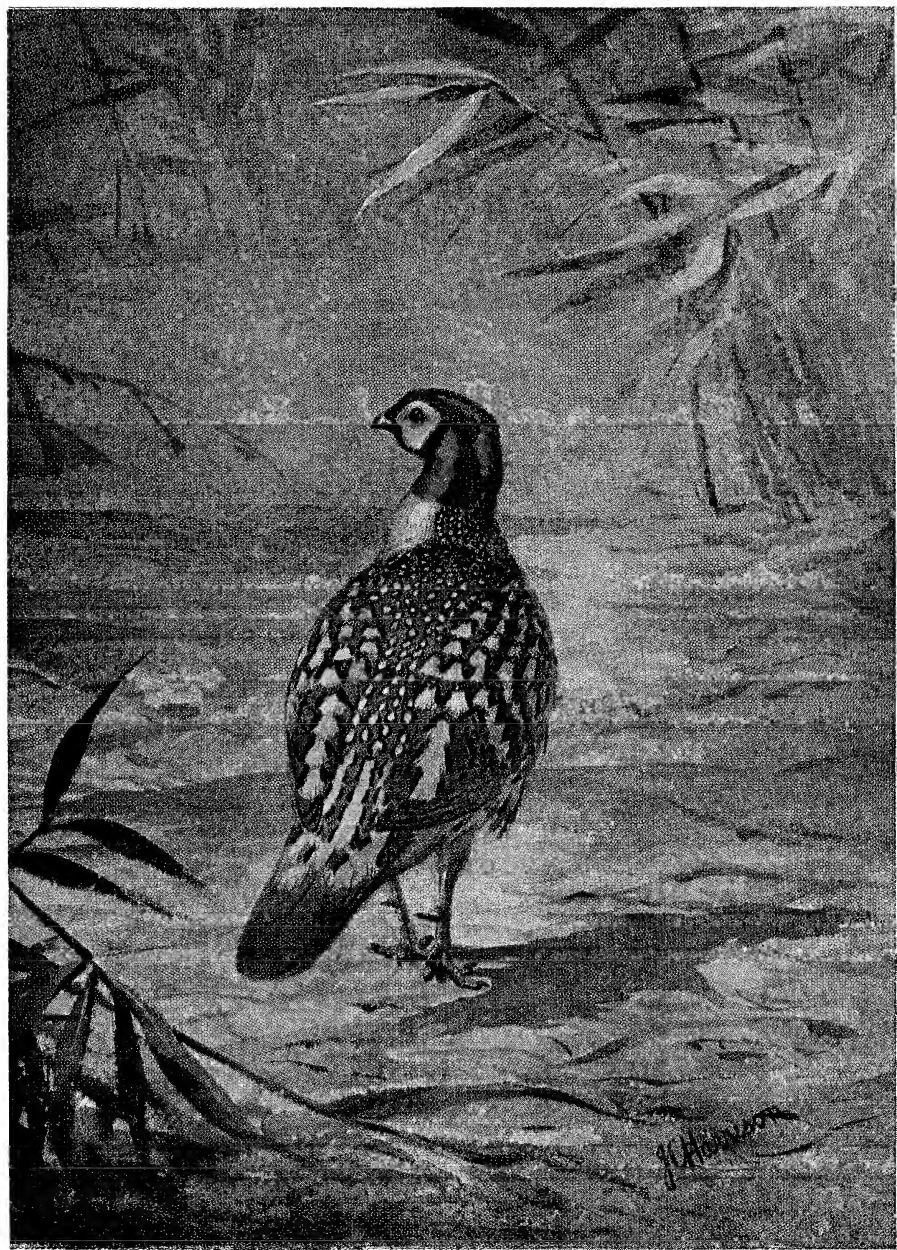
'When in 1927 Mr. J. Spedan Lewis very generously became interested in my coming fourth expedition to Indo-China, and so enabled the British Museum to share in the results as on previous occasions, he suggested that we might try as well to get, for himself



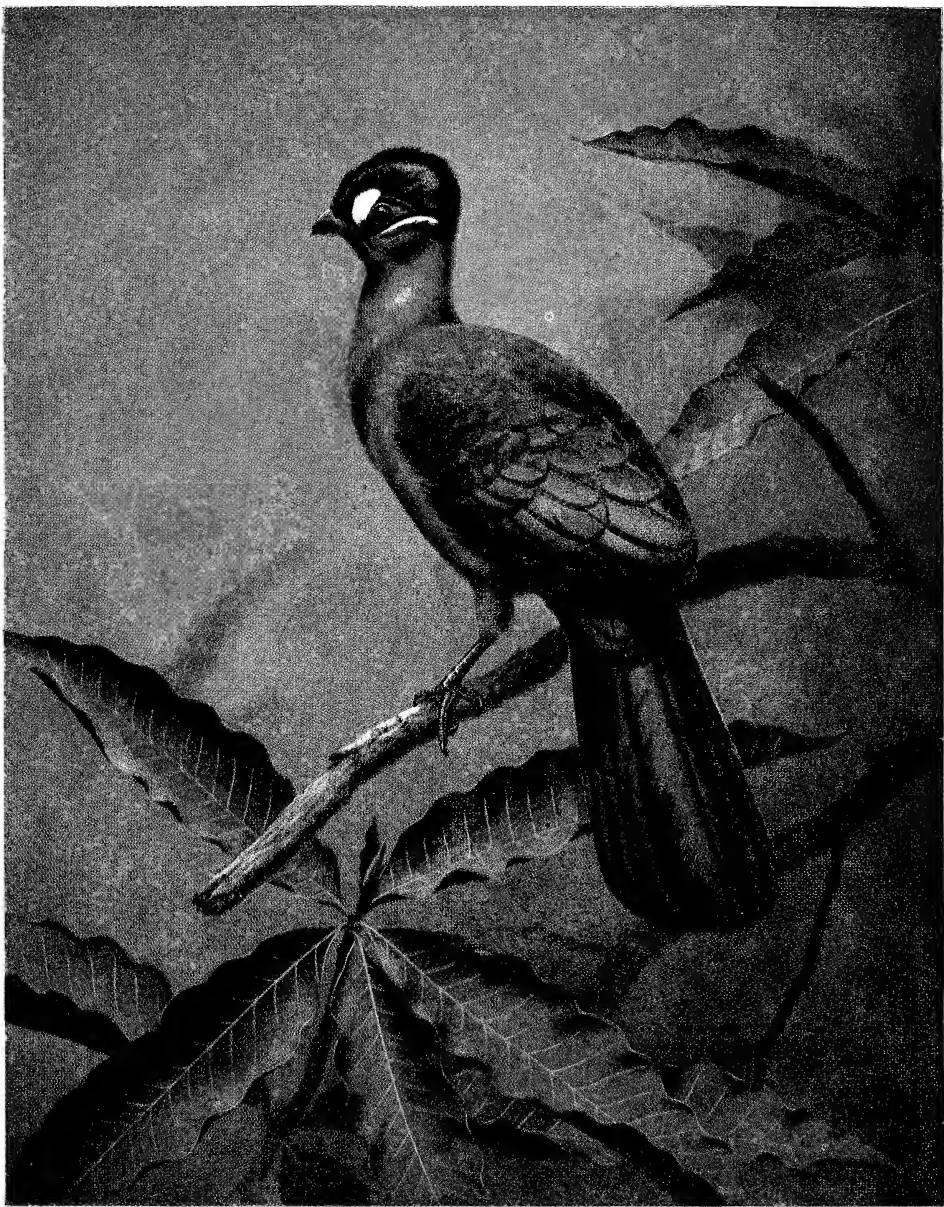
Vicillot's Crested Fireback Pheasant
Lophura ignita rufa



Hooded Pitta
Pitta sordida



Cabot's Tragopan
Tragopan caboti



Hartlaub's Touraco
Tauraco hartlaubi

and myself, a collection of living birds from Annam. We decided to share the additional expenses and engaged Mr. C. S. Webb to come over and join me.

'On 29th February, 1928, Mr. Webb and his brother arrived at Hue, and when I knew what his requirements were, I decided to establish his camp at Thua-Luu, ... on the railway line between the sea and the foot of the mountains.

'I returned home at the end of April, having left Tourane on 19th March and brought back with me a number of birds alive ... Eastern Sarus Cranes, Rheinardt's Argus, Edwards' and Bel's Pheasants, Ghigi's *Polyplectron*, Tree Partridges, Renauld's Ground Cuckoos, etc., as well as a pair of fine new Pheasants from Cambodia which I have since described as Lewis's Pheasant (*Gennaesus lewisi*). At Singapore I added Malayan and Bornean Argus, Noble Pheasants, Java Junglefowl, one young Malay *Polyplectron*, a rare bird, etc.

"Messrs. Webb, however, stayed behind and left Annam at the end of April, landing at Marseilles on 25th May, with a fine collection. They worked continuously at Thua-Luu, trapping birds most skilfully and establishing them with the greatest care and patience. In fact, no one else can capture and acclimatize difficult insectivorous birds better than they do. They brought home, in the best of condition and in spite of many difficulties, forty species of birds ... twenty two of which were landed alive in Europe for the first time.

'... [Among them were] Five Rheinardt's Argus (*Rheinardtius ocellatus*). Four Edwards' Pheasant (*Hierophasis edwardsi*). Two Ghigi's Polyplectrons (*Polyplectron c. ghigii*). Three Merlin's Tree Partridges (*Tropicoperdix merlini*). Two Laotian Rufous-throated Hill Partridges (*Arborophila rufogularis tickelli*) ... First importation ... one La Touche's Owl (*Athenoptera s. latouchii*). One of the rarest of Owls; only three skins collected so far; a tiny bird, with a small head and long wings. Reddish brown, with a most delicate feather pattern and hue ...

'Twelve Renauld's Ground Cuckoos (*Carpococcyx renauldi*). One Indian Cuckoo (*Cuculus micropterus*). First importation ... Two Green Bee-eaters (*Merops viridis*). First importation, and one of the handsomest species of this wonderful genus ... Three Annamese Pittas (*Pitta n. soror*). First importation. A big bird ... Two Swinhoe's Pittas (*Pitta nympha*). First importation; the migratory Pitta which sometimes reaches as far north as Japan...

'Three Elliot's Pittas (*Pitta ellioti*). First importation of one of the most beautiful and rarest birds in Asia ... Three Frie's Scimitar

Babbler (*Pomatorhinus t. friesi*). A bird described by me two years ago. One of the *tickelli* group, with a white breast ... I often heard it whistle in the forests of Annam. It has one of the most wonderful voices that I ever heard, full, deep and mellow. First importation ... Five Chaulet's Yellow Cissas (*Cissa hypoleuca chauleti*). One of the gems of the collection and of the Indo-Chinese avifauna. They resemble in shape the Yellow-bellied Cissa, which has been figured last year in this Magazine, but is of a much richer yellow below, while the whole of the upper parts are washed with a golden tinge. So far the type specimens only had been found. A local and very rare bird, very difficult to obtain ... Twelve Black Racket-tailed Magpies (*Chrysirhina varians*). Imported for the first time.

'Some of these birds have been presented to the London Zoo and to Mr. A. Ezra, whilst the others remained in Mr. Lewis's or my own collections ...'

(A collection of living birds from Central Annam. September, 1928. (Series IV), Vol. VI, 212 - 216.)

'... good additions to my Pheasants ... During the past years are two cocks and one hen Mikado ...

'For the first time my numerous Cranes have been separated in pairs in different fields. I hope some will nest next year. I have tried Cariamias at liberty; one male of the Crested species proved dangerous to other birds, while a female and one Burmeister's are quite harmless. They are amusing and absurdly tame ...

* * *

'I was able to add several interesting and rare species to my collection of Waterfowl during the last summer; Red-breasteds, Abyssinian Blue-winged, Siberian Bean Geese, South African and Paradise Sheldrakes, Steamer Ducks and Madagascar Teal (*S. bernieri*). Some three hundred young have been bred last season, including Ringed, Chilian, Blue-winged Teal.

'I have now a dozen Eider Ducks in perfect health, and as some are now three years old I have hopes of their breeding next spring. Scoters, sent from the seashore, have been on the lake for several weeks and seem to do well.

'My friend Mr. Spedan Lewis sent me a fine pair of Snowy owls, which I have housed in a quaint aviary arranged in a ruined tower, where they are doing beautifully.

'In conclusion let me give news of my greenhouse aviary, of which I told you last December. All the birds have been doing beautifully in it so far, with the exception of the Tanagers, many of

which died as a result of their feeding too much on the Sunbirds' food; that cannot be avoided. Blue-winged, yellow, violet and all greens are exceptions and still flourish. Sunbirds, Sugarbirds and Pittas are perfect, and also one pair of King Birds of Paradise, and a pair of Amethyst Starlings which I added to the collection two months ago.

(Bird Notes from Clères. February, 1929 (Series IV), Vol. VII, 25 - 26.)

'It is doubtful if there are, anywhere in the world, so many living creatures of all sorts assembled in fifteen acres of ground. I have visited and described most of the collections of living birds of the world, but to give an idea of that of Mr. H. Whitley is almost an impossible task.

* * *

'With the exception of one large and a few smaller aviaries ... the innumerable houses, shelters, bird rooms, flights and enclosures have been established without sacrificing the practical side of the artistic aspect...

'There are ... a Cassowary (*C. altijugus*) ... a lovely pair of Pileated [**Herons**] (*Pilerodius pileatus*); Kagus ...

'Parrots and Parrakeets are the best feature in Mr. Whitley's Zoo, and he owns the best and most important collection of these interesting birds which exists at present ... among the more interesting ones I noticed Bornean Lories, Purple-capped Lorikeets, Hyacinthine, Lears, Spix and Noble Macaws, Palm, Black, Goffin's, Ducorp's and Bare-eyed Cockatoos; White-eyed, Queen of Bavaria and Weddell's Conures; *Pyrrhura rhodogaster*, *emma*, *rupicola* and *haematotis*; Jamaican, Pretre's, Salles, Yellow-fronted and Yellow-bellied [**sic**] Amazons; Short-tailed Parrots, Ruppell's, Red-bellied and Brown-necked Parrots; Great-billed Mueller's [**sic**] Parrots; Queen Alexandra's, Red-shining, Tabuan, and Koro Parrakeets; Golden-backed Hanging Parrakeets; Purple-capped Parrakeets.

'... European Eagle owls bred three young ones last year. A special mention must be made of several pairs of African Pigmy Falcons (*Poliohierax*), kept in indoor aviaries, which have laid. There are Burmese and Lort's Rollers (the latter have bred), Touracous (*Turacus donaldsoni*, *Gallirex porphyreolophus* and *chlorochlamys*, *Corythaixoides leucogaster*, *Gymnoschizorhis* sp.) Ground Hornbills, various Toucan, one Greater Ani, Motmots and Jackasses.

'Passerine birds are very numerous and I noticed pairs of Wallace's, Twelve-wired, and Red Birds of Paradise; Australian Ravens and many other Corvidae; numerous Starlings, with curious hybrids, Burchell's x Baywings and Superb x Royal ... There are lots of hybrids, as hybrid breeding in birds and animals is one of Mr. Whitleys special objects ...

(The Primley Zoo. October, 1930. (Series IV), Vol. VIII, 259 - 261.)

* * *

DOVES IN A NATAL GARDEN

By L. Gibson (Oregon)

These few notes are on a pair of Laughing Doves *Streptopelia senegalensis*, and two pairs of Red-eyed Doves *S. semitorquata* which were resident in our garden in Durban, Natal. Just about every morning of the year we were wakened by a pair of the former species which sat outside the window in a 20 ft. Rubber Tree *Ficus elastica*, to warm themselves in the sun's first rays. Their soft, accelerating cadence of coos was pleasant enough, except in summer when they began at about 4.30 in the morning (no-one in South Africa having the wit to make the great leap into the 20th century and introduce Daylight Saving Time)!

A further year-round inconvenience arising from this was that it became dark between 5.00 and 7.00 pm, leaving no time to enjoy outdoor activities - such as attending to the aviary - during the working week. The cooing figured in our daily existence more than we realised for when a Laughing Dove began to call on TV here, our old dog jumped up from its slumbers and headed for the door. A previous hobby of his had been running down the doves, with limited success, and old habits die hard.

Commencing on 4 June, the doves built their usual fragile-looking, sparse platform of twigs in an exposed position right on top of a Bougainvillea bush, conveniently situated just below the kitchen window. It was completed in two days. Various plants in the garden that had thorns were utilised by assorted nesting birds - the motivating force seeming to be the fear of tree snakes.

On the first day of building there were uncharacteristic heavy downpours and gales blew throughout the following day. But the little apology for a nest -built in a sheltered spot against the house -held firmly, while half the nests elsewhere blew out of the trees during a prolonged gale.

The winter is usually one long spell of cool nights and pleasantly warm, rain-free days, and no doubt this is why the doves choose to nest at this time. Being right on the seaside, the weather was marred by sporadic strong winds, both in mid-winter and mid-summer.

With very neat timing, an egg was laid the day after the nest was completed, followed by another the following day, 7 June. Two squabs hatched on 20 June, almost exactly on the winter solstice.

During incubation and brooding, the day temperature was between 22° - 25°C. (72° - 75°F.), and 11° - 16° C. (52° - 61°F.) at night. The chicks were covered with long, widely-spaced, tawny down, and soon their crops were bulging with pigeon's milk.

The temperature always reached 21°C. (70° F.) by about 10.30 am each day, at which time the hen often left the nest to sunbathe on an adjacent shed roof. The parents foraged mostly in the large garden, lining up every morning for the daily bread handout, along with the resident pairs of Yellow-vented Bulbuls, Indian Mynahs and Red-eyed Doves - as well as two House Sparrows from over the wall, where they lived on spilled seed from an outdoor battery of canary cages.

On the 13th day the chicks were perching on the edge of the twig platform. On 5 July, the 15th day, they left the nest, probably because I was gardening underneath it. This was about a day premature. One landed in a nearby tree, while the other found its way to a tree in a neighbouring garden. They were not checked the next day, but on 7 July both were back on the nest.

The following day, both had gone by noon. They stayed on an exposed branch of an adjacent Norfolk pine for the next two days, leaving to disappear into denser branches when the garden was buffeted by a fierce squall. They remained hidden and did not move from the spot for another five days, during which time the wind blew hard - up to 90 m.p.h.. Both parents were still in attendance when the young doves finally left the vicinity on the 25th day. They were fed throughout that time.

Soon afterwards another nest was built in a small lemon tree, also below the window, and one chick was hatched. On the second night the hen was scared off the nest and did not return in the darkness. The chick was brought indoors and put back in the nest the following morning, long after it was light. The hen reappeared and commenced brooding and feeding as though nothing had happened.

The doves foraged mostly on the ground for weed and grass seeds, also taking hard berries that had fallen from trees. Sometimes they collected half ripe berries directly from the tree, but were not seen to eat soft berries or fruit.

It was difficult to see if they picked up the occasional insect, but were thought not to do so. However, there was one exception to this. Several times a year, day or night and irrespective of weather conditions, termites swarmed by the millions - in spite of the tradition that they only do so in the damp.

When this happened, all sorts of creatures threw caution to the wind and appeared on roadways to gorge on the insects. Blue-headed Agama lizards jostled skinks and geckos, and even some small snakes, for a place among hordes of insect-eating birds ranging from Pied Crows to sunbirds. The Laughing Doves, as well as the larger Turtle Doves, all got in on the act.

Two pairs of much larger Red-eyed Doves nested in incredibly spiky date palms at opposite ends of the garden. The palm fronds were armed with stiff 3-inch spines and dead fronds fell from the tree at regular intervals. If you spotted one descending you learned quickly to leap out of the way - after your first lacerating!

The nests were thus totally inaccessible, so nothing was noted about them. The adults foraged, just like the Laughing Doves, presumably taking larger items. When approaching or leaving the nest, the parents often made a peculiar cat-like miaow, especially if they saw us, although it was some time before we associated this unpigeon-like noise with the doves.

These doves, along with bulbuls, gorged themselves on the little dates that were about 20% fruit and 80% stone. How the bulbuls managed to pass these big hard seeds was a mystery. The Laughing Doves may have eaten them, but were not seen to do so.

Nestling Laughing Doves suffered much from tree snake predation, and occasionally from a passing crow, but the Red-eyed Doves were more secure, deep in the crown of the lethally-spiked palm. Snakes were able to move freely among thorns, because most of the native trees were so armed - but the palms stood separate from other trees and this helped.

Some of the Laughing Doves had a much pinker tinge than others during the breeding season. It should not be difficult for some enterprising person to breed this easily-managed species into a permanent pink pigeon mutation - if they haven't done so already. The same remarks applied to the blue on the Red-eyed Doves, with one cock having noticeably more and brighter powder blue on the head and neck than rival cocks.

NOTES ON BREEDING THE BLACK-THROATED LAUGHING THRUSH

By Michael E. Mace (San Diego Wild Animal Park)

Black-throated Laughing Thrushes *Garrulax chinensis* are endemic to Burma, Thailand, Vietnam, Laos, and Hong Kong. Their habitat is secondary growth consisting of thickets, bamboo stands and forest understory below 1,200 m (King et. al., 1975). There are 48 recognized species of *Garrulax* currently listed that can be found in Asia (Howard and Moore, 1991). The Black-throated Laughing Thrush is a monomorphic species.

Upon arrival in the collection, each bird goes through a customary 30-day quarantine period. During this time they are subjected to a few tests to determine their health status. Towards the end of the quarantine a laparoscopy procedure was used as a method to accurately determine the gender of each bird which fortunately proved to be an adult pair.

The Wild Animal Park has kept Black-throated Laughing Thrushes from 1988 until 1992. During this period the birds have been successfully bred in two vastly different styles of aviaries, hatching a total of 15 chicks.

The first breeding occurred in an open air, public walk-through aviary that measured 43 x 33 x 12m. The exhibit was well planted and housed 35 species of birds consisting of 107 specimens. Of this grouping, six other *Garrulax* species were kept with *G. chinensis*. They were Tickell's Laughing Thrush *G. streptians*, White-throated Laughing Thrush *G. albogularis*, White-browed Laughing Thrush *G. sannio*, Yellow-throated Laughing Thrush *G. galbanus*, Red-winged Laughing Thrush *G. formosus*, and Red-tailed Laughing Thrush *G. milnei*. The first four species listed have also successfully produced chicks in this exhibit.

The second aviary measured 6 x 1.2 x 3m and was adequately planted with Purple-leafed Plum *Prunus blireiana*, Podocarpus, *Podocarpus gracilior* and Russian Olive, *Elaeagnus angustifolia*.

The cage mates in this aviary were a pair of Golden-breasted Starling *Cosmopsarus regius* and a pair of Celebes Quail Doves *Gallicolumba tristmata*.

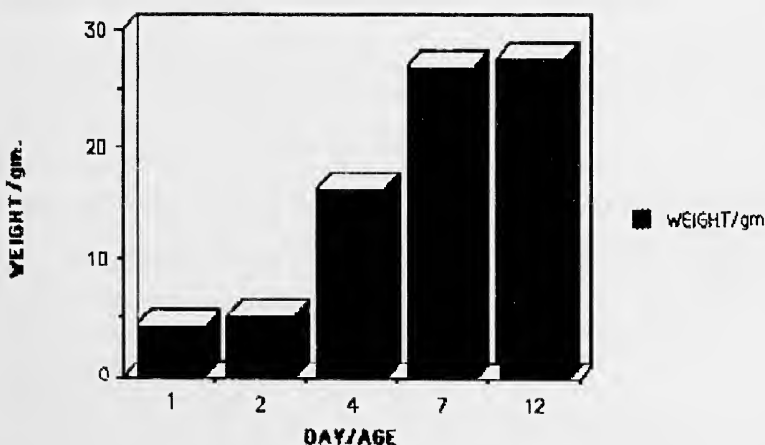
The birds nested in the tallest available plant in this aviary which was the Purple-leafed Plum. One difference in the nesting in this aviary was that the Laughing Thrushes would only build the

nests in a pre-hung wicker basket.

The breeding pair is very secretive when building a nest, and equally reclusive when incubating or brooding. However, they would readily return to a nest if disturbed as was the case when data was collected on *G. streptians* in an earlier study (Mace, 1991).

In the large walk-through aviary, the Black -throated Laughing Thrushes consistently built their own nests in Golden Bamboo *Phyllostachys ourea*. The average height of four nests measured 3.37m from the ground. The size of each nest measured 135mm x 66mm overall. The primary building components for each nest were strips of California Grape *Vitus californica*. The nest cup was lined in a softer material consisting of excelsior fibres of the Quaking Aspen *Populus tremuloides* which was distributed on the ground for the birds to utilize. A completed nest was analysed and found to weigh 43.7g and contained 523 pieces of nest material with the longest fibre measuring 52cm and the median fibres measuring 31cm.

The average clutch consisted of three to four eggs. The eggs are laid every other day and are completely porcelain white in appearance. Eight eggs were measured and the median size was 28.4mm x 18.00mm and weighed 5.8g. at day one. Egg-laying occurred from April until July. The incubation period was 13 days. The male and the female participated in the incubation, commencing with the second egg laid



Data from "Bk. Throated Laughing Thrush"

Upon hatching the nidicolous chicks are cared for by both of the parents which participate in the feeding of the chicks by making numerous trips to the nest. The chicks develop rapidly and by the 13th day each chick had fledged (see graph). At this stage flight is limited to short flights at low altitudes with the attentive parents displaying aggressive tendencies towards all intruders. At fledging, the chicks are covered with a slate grey plumage. The bill is black, lined in yellow which will eventually change to solid black.

In the wild, Laughing Thrushes feed primarily on a variety of invertebrates which can only be simulated in captivity. Our adults are maintained on a diet of mealworms, crickets, moistened dog chow and a multi-vitamin (Super Preen). When the adults are feeding young, additional insect food is offered throughout the day.

ACKNOWLEDGEMENTS

Appreciation is extended to William Toone, Curator of Birds, for his constructive comments on an earlier draft. Thanks also to Patricia Witman, Senior Keeper, for assistance in collecting some of the data necessary for this paper. Lastly to Robert Thurston, Lead Gardener, whose botanical knowledge aided in identifying some of the flora used by the birds. All three are employed by the San Diego Wild Animal Park.

REFERENCES

- HOWARD, R., and MOORE A. *A Complete Checklist of the Birds of the World*, Acedimic Press.
- KING, B., WOODSTOCK, M. W. and DICKERSON, E. C. (1975) *A Field Guide to the Birds of South-east Asia*, Hong Kong, South China Printing Co.
- MACE, Michael E., (1991). *Breeding and hand-rearing Tickell's Laughing Thrush (Garrulax streptians)*, International Zoo Yearbook **30**: 187 - 191.

PRODUCTS MENTIONED

Superpreen vitamin: manufactured by Super Preen Products Inc. 1000 East Williams Street Suite 100, Carson City, NE, USA.

Wayne Dog Chow: manufactured by Royal Canine USA Inc. St. Charles, Mo. 63303 USA.

* * *

SOME OBSERVATIONS ON ROSE-RINGED PARRAKEETS IN SRI LANKA

Stefan Luft (Dinslaken, Germany).

INTRODUCTION

Rose-ringed Parrakeets *Psittacula krameri manillensis* belong to a genus whose members have the widest range of any parrot species in the world. They are also common on the beautiful island of Sri Lanka and in south-east India. Five members of the order Psittaciformes live on the island - four of them belonging to the genus *Psittacula*. They are the Rose-ringed, Alexandrine *P. e. eupatria*, Emerald-collared *P. calthorpe* (which is an endemic) and Plum-headed Parrakeet *P. cyanocephala*. The fifth member is the Ceylon Hanging Parrot *Loriculus beryllinus*, which is also an endemic (Henry 1978).

Rose-ringed Parrakeets are found in most areas of the island, but they seem to prefer the plain areas of the dry zone. They are also found in the wet zone and in cultivated districts, where they can cause considerable damage in paddy and grain fields (Henry 1978). The breeding season lasts from November until June, sometimes later. At this time pairs normally leave the flocks, which can number up to 100 individuals, to start their breeding activities. The two or three eggs are laid in dead trees, abandoned woodpecker or barbet holes, and similar situations which provide nesting opportunities.

Sometimes they breed in less closed colonies, especially when the number of nest holes and occurrence of other parrakeet and bird species makes it necessary. I watched all five species in February/March 1993 in the lower hill wet zone in the surroundings of Kandy and Peredeniya. It is interesting that the Alexandrine Parrakeet also breeds in this area, because normally it is a species of the low country dry zone. But there seems to be a general change in distribution of Sri Lankan birds, whereby dry zone species move into the wet zone and low country birds further up into the hills (Hoffman).

CHOICE OF FOOD

This parrakeet feeds on a large variety of fruits, nuts and seeds. Ali and Ripley (1969) describe them feeding on nectar from *Salmalia*, *Buttea* and *Erythrina* flowers. Further, they feed on paddy, grain and maize (Henry 1978, Forshaw 1977). I watched

Rose-ringed Parrakeets feeding on the fruits of *Samanea saman*. I counted 30 to 50 parrakeets in these trees, feeding on the flesh of the long fruits while ignoring the seeds they contained. It can take up to 10 minutes for the birds to consume the flesh of one fruit before allowing it to fall to the ground while they start on another.

In the same trees I observed the Ceylon Grey-necked Crow *Corvus splendens protegatus*, which also fed on the fruits. I watched them attacking the parrakeets and following them for more than a few hundred metres. The crows flew nearly as fast as the parrakeets, so that the last ones were in critical danger of being captured by the very aggressive crows. But their agile flight, combined with their smaller bodies, allowed them to fly through the trees at enormous speeds to elude their larger, but less agile attackers. In only one hour I counted 16 attacks by the crows.

Another feeding tree seems to be *Schleichera oleosa*. I watched Rose-ringed Parrakeets taking small pieces of the bark and eating it. Sometimes they also fed on the seeds. In comparison to their activities in the *Samanea saman* trees, I watched only up to five individuals in *S. oleosa*. In the famous botanical gardens of Peradeniya I watched Rose-ringed Parrakeets apparently searching for food in *Parkia roxburgii*. I never actually saw them feeding. On the ground I found some fruits with marks that might have been made by Parrakeet bills. In the same tree I found the nest holes of Rose-ringed and Plum-headed Parrakeets. Some Sri Lankans told me that the parrakeets also feed on bananas, papaya and the fruits of the Yax tree,

DAILY ACTIVITIES AND PERIODICITY

There is not a great deal of information about the daily periodicity of members of the genus *Psittacula* in Sri Lanka. Forshaw (1977) describes Alexandrine parakeets flying to their feeding grounds at sunrise. In the evening, parrakeets return to their roosting trees in groups. The Rose-ringed Parrakeet seems to move about a good deal while searching for food each day.

The parrakeet year is subdivided by one or sometimes two breeding seasons. Table 1 gives a comparative summary of the different *Psittacula* species in Sri Lanka after Henry (1978). It becomes obvious that all four species are breeding from February to May. Some species start one or two months earlier, two species sometimes have a second breeding period. These circumstances are responsible for a strong nest hole concurrence between the parrakeets, which is strengthened by other hole-breeding birds like Ceylon Common Mynahs *Acridotheres tristis melanosternus*, barbets

and woodpeckers. I found the nest holes of parakeets and mynahs in one tree. The situation between the different parakeet pairs is similar and produces agnostic actions every day.

To obtain more information about the daily activities of the breeding parakeets, I watched 16 nest holes found in an area of nearly 3.2 ha. Of this number, 10 nest holes belonged to Rose-ringed parakeets, four belonged to Rose-ringed Parakeets, four to Emerald-collared Parakeets and only one each to Alexandrine and Plum-headed Parakeets. Complementary, I counted the flying activities of the genus *Psittacula* in the surroundings of Kandy on several days and made some observations at feeding trees.

Flying activities started with sunrise and achieved a first maximum point at nearly 6.30 am. It stopped at 9.00 - 9.30 am. In this period the parakeets seemed to fly from their sleeping and breeding trees to their feeding places, which could be several kilometres away. I was able to watch groups of up to 50 individuals at feeding trees during this time. Pairs very often fed their young from sunrise to 11.00 am. After this time there seemed to be a pause, which was signed by only a few feeding activities at the nest holes.

TABLE 1: BREEDING PERIOD OF SRI LANKAN PSITTACULA SPECIES.

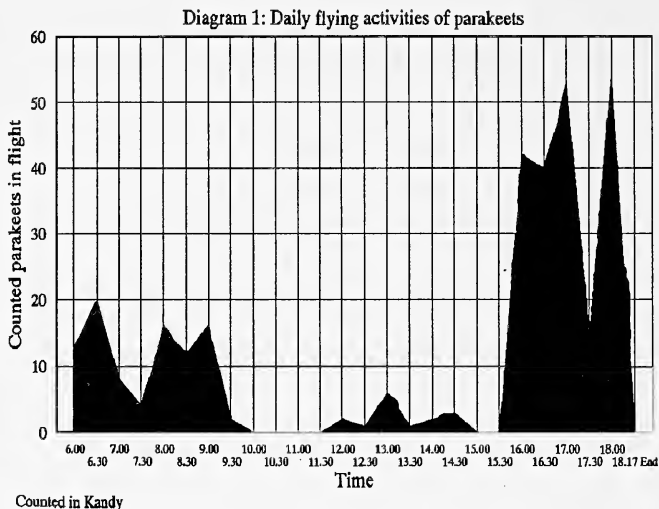
Month	<i>P. e. eupatria</i>	<i>P. k. manillensis</i>	<i>P. calthorpe</i>	<i>P. cyanocephala</i>
January	+	+	+	
February	+	+	+	+
March	+	+	+	+
April	+	+	+	+
May	+	+	+	+
June		+		
July			++	
August			++	++
September			++	++
October				
November	+	+		
December	+	+		

+ = First breeding period

++ = Second breeding period

A new maximum of feeding activities started at nearly 3.00 pm. After 9.30 am, there were only a few flying parakeets to be watched, and only between 12.00 and 2.30 pm were there more activities which were on a comparatively low level. The flying activities started again at 4.00 pm. At that time the parakeets

seemed to fly to their feeding places again, leaving them at twilight. From 3.30 to 5.45 pm many feedings at nest holes could be observed. The situation at the feeding trees was similar.



I watched them flying alone, in pairs or small groups of up to 12 individuals. The flying height varies between 20 and 150 metres. **Diagram 1** gives a survey of the flying activities of *Psittacula* parakeets in an area near Kandy for one day.

BATHING

First of all, I want to point out that I never saw Rose-ringed Parakeets bathing in rain in Sri Lanka, but some parakeets bathe in water bowls in aviculture and rain bathing is described, too (Smith 1972).

I watched some Rose-ringed parakeets bathing in the wet leaves of trees after a rainy night. They flew into the fine structured leaves and whirled up the water by using their wings and shaking their bodies. Sometimes they hung inverted in the trees and opened their wings, shaking their heads and bodies. Their tails were spread and nearly all body areas were wet. Sometimes their bodies seemed to become too heavy for the birds to fly, so they had to shake to dispose of surplus water. This bathing behaviour could last up to 15 minutes.

REFERENCES

- ALI, S. and RIPLEY, S.D. (1969). *Handbook of the Birds of India and Pakistan*, Volume 3, Oxford.
- FORSHAW, J. M. (1977). *Parrots of the World*, Melbourne.
- HENRY, G.M. (1978). *A Guide to the Birds of Ceylon*, Kandy
- LUFT, S. (1993). *Notes on the Psittaciformes of Sri Lanka*, Summary of the IPF-field-study, Oberhausen.
- SMITH, G. A. (1972). Some observations on Ringnecked parakeets. *Avicultural Magazine* 78: 120 - 137.

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* * *

THE LARVON BIRD GARDENS, ZIMBABWE

By Jeffrey Boswall (Bristol)

Just outside Harare (formerly Salisbury), the capital of Zimbabwe (formerly Southern Rhodesia), lies the Larvon Bird Gardens. Owned and run since about 1991 by Frikkie and Henry Prinsloo, the gardens were taken over from a Harry Scott who founded the collection, mainly on orphaned birds brought in, and on donations of young birds.

The Prinsloos were originally interested particularly in parrots and these there still are, perhaps 25 species, but the majority - say 200 - of the c260 species now kept are indigenous Zimbabwean species. The few other exotics include Black Swan, peafowl and Indian Hill Mynah, all outstandingly popular with the public.

About 100 species live in a walk-through aviary where, on 17 December 1993, a number of birds were nesting including Wattled Plover. Red-faced Mousebirds, as well as different weavers, sunbirds, shrikes, starlings, finches, Estrildids and others can be studied at very close quarters. The whole establishment, from the standpoint of a birdwatcher, is a three dimensional living field-guide!

From the point-of-view of animal welfare, a good job is done with sick and injured wild birds and with unwanted captive ones. Then again, from a conservation perspective, research is intended into the breeding of - in particular - birds of prey. There are eight species of eagle, (including the Black) - a couple of Secretary Birds, a Gymnogene (a kind of harrier hawk), a Yellow-billed Kite (being a race of the Black) and four vultures including the Cape.

There is no limitation on size with Great White Pelican (at 25 lbs the heaviest flying bird?), Greater Flamingo (apart from cranes like the Sarus, surely the tallest flying bird), the Marabou, also very tall (a stork succeeding in being a vulture?) and the largest of all birds, the Ostrich (and the only living species so distinctive that it is in an order all of its own, and is the only one so 'honoured' out of - at the latest count - 9,650 bird species).

The collection of owls includes Pel's Fishing Owl and the Pearl-spotted. I tried to get the latter to turn its head and show me the 'eyes' in the back of its head but failed, so I've written to suggest that a mirror be fitted at the back of its cage.

Well over half the visitors are tourists from overseas, and while only a proportion of Zimbabweans who will enter are true locals, the proportion is increasing and the birds on display should help educate *all* Zimbabweans about their rich avian heritage.

NEWS AND VIEWS

SODA EXTRACTION MAY JEOPARDISE FLAMINGOS

Considering that the East African population of the Lesser Flamingo *Phoeniconaias minor* may number as many as four million, it is remarkable that their nest place remained undiscovered until 1954 when the late Leslie Brown almost lost his life attempting to cross the scorching hot soda flats to reach the birds' nests at Lake Natron, northern Tanzania.

Occasionally they build nest mounds and lay eggs at other Rift Valley lakes, but have only once been known to do so successfully at Kenya's Lake Turkana and, in 1962, at Lake Magadi. Even on that occasion many nestlings had to be rescued and others died as a result of encrusted soda forming anklets around their legs and weighing them down.

Only at Lake Natron do huge flocks breed successfully on a regular basis. Now a plan is afoot to build a factory there to extract the soda - which, should it go ahead, could disrupt for ever the delicate balance of this unique site.

Malcolm Ellis

* * *

BREEDINGS AT BIRDPARK AVIFAUNA

Hartlaub's Touracos *Tauraco hartlaubi*, Which hatched two chicks, were the first birds to breed this year in the Tropical House (Martinus Hall) at Birdpark Avifauna. Masked Plovers *Vanellus miles* were also early and our first breeding pair started to lay eggs on 6th January. Many eggs followed and by mid-March nine chicks had hatched.

The tropical temperature in the hall suits many of our doves and pigeons and breeding results with several have been good. Two species of fruit doves, the Orange-fronted *Ptilinopus aurantifrons* and Black-chinned *P. lechlancheri*, together with Red-throated Ground Dove *Gallicolmba rufigula* were all successful.

Plovers and pigeons are held as pairs but Grosbeak Starlings *Scissirostrum dubium* can be kept in a group. The first chick fledged this year on 26th January.

We are expecting the chick of our pair of Great Hornbills *Buceros bicornis homrai* to fledge in May. We are very pleased that we can continue our progress with this subspecies for the E.E.P. Project. After a recount we have recognised that this particular pair

has now raised 11 chicks over a 13 year period.

Even more successful are our small but very aggressive Black Crakes *Limnocorax flavirostra*. As I write in March, eight chicks are walking in the Martinus Hall free-flight aviary.

Outside, where conditions earlier in the year were not so tropical, White-breasted Cormorants *Phalacrocorax lucidus* successfully raised chicks during a period of very low temperatures.

Hans van der Sluis

* * *

NEW SPECIES?

A new, small partridge-like species discovered in evergreen forest in the Udzungwa Mountains of Tanzania, is unusual enough to have had a new genus created for it and has been named *Xenoperdix udzungwensis*. Five scientists from the Zoological Museum of Copenhagen University, led by Dr. Lars Dinesen, who made the find, said the birds appeared to be plentiful locally. They are - they think - survivors of a species once common along the African coast and across into Asia.

Malcolm Ellis

* * *

FIG PARROT RECOVERY PROGRAMME

Australians are being encouraged to report any sighting of Coxen's Fig Parrot *Opopsitta diophthalma coxeni*. It is part of a recovery programme for this subspecies - a race of the Double-eyed Fig Parrot found in New Guinea - considered to be one of seven Australian birds in imminent danger of extinction. Possibly fewer than 50 remain in subtropical rainforests in coastal regions of southern Queensland and northern New South Wales. Surveys in areas where it used to be seen have produced only one sighting.

So little is known about its habits that should a captive breeding programme become necessary, as seems probable, staff at Currumbin Sanctuary in Queensland are developing appropriate breeding techniques with the Red-browed race from northern Queensland. After a number of ups-and-downs, several clutches were raised last year. So Curator, Liz Romer is confident they can now breed fig parrots 'fairly successfully'.

Malcolm Ellis

* * *

VANISHING RAINFORESTS

The World Wide Fund for Nature, which is campaigning to save the tropical rainforests, estimates that less than half the rainforest

which just 80 years ago covered large parts of Africa, Asia and South America is still standing. Each day, 74,000 acres are cleared by logging, mining, ranching and subsistence farming. WWFN says that at the present rate of destruction, by the year 2000 virtually no rainforest, apart from small areas of protected parkland, will remain in Sumatra, Thailand, the Philippines, the Ivory Coast and Nigeria. And unless strenuous action is taken quickly, even the two greatest areas of rainforest, in the Amazon and Congo basins, could have gone by the year 2025.

Malcolm Ellis

* * *

CONVENTION AT LORO PARQUE

The third International Parrot Convention, which has the theme 'Parrots Today', will be held at Loro Parque from 14th - 17th September 1994. Speakers include breeders, vets, scientists and conservationists who will cover a wide variety of topics.

Malcolm Ellis

* * *

MELLER'S DUCK IMPORTED

Six Meller's Duck *Anas melleri*, the first to be imported into captivity from Madagascar since the 1930s, arrived at the Jersey Wildlife Preservation Trust last year. Glyn Young, Section head - Birds at JWPT, also brought back four specimens of the Madagascar Teal *A. bernieri*, all of them males. Only one Madagascar Teal has ever been kept in captivity and the species was believed extinct for a number of years until 'rediscovered' in 1968. Now, habitat destruction poses a major threat to its survival in the wild and it is hoped further examples will be brought to Jersey this year.

* * *

PARTRIDGE SIGHTINGS

There has been a report from Vietnam of two sightings of David's Tree Partridge *Arborophila davidi*, also known as the Orange-necked Hill Partridge. The species had not been seen in the wild since 1927 and was presumed to be critically endangered, if not extinct.

Malcolm Ellis

* * *

BIRD CHALLENGE FOR BUSINESS

Some of Britain's biggest companies, including Shell and ICI, are taking part in an innovative survey of birds living and breeding on industrial sites in the UK. Organised by the British Trust for

Ornithology and sponsored by Zeneca, the 1994 Bird Challenge for Business runs throughout the year with companies sending quarterly returns to the BTO of birds observed on their land.

Populations are surprisingly diverse and a two-year survey carried out recently at Shell UK's 1800-acre Stanlow Manufacturing Complex at Ellesmere Port revealed more than 150 species, of which over 60 were breeding there.

* * *

DUIVENBODE'S LORY

Confusion over the first recorded UK breeding of parent-reared Duivenbode's Lories *Chalcopsitta duivenbodei* has now been resolved. Responding to a request for information (*Avicultural Magazine*, 1993, 99, 158), Rosemary Low writes: 'Parent-reared young were produced by a pair belonging to Bob Grantham and myself in 1983 and 1984 and perhaps after this; I do not have the records after 1984. These breedings are recorded in the third edition of my work *Parrots, Their care and breeding*, pages 334-5. In the first nest, one chick was hand-reared and one was parent-reared. I recall feeding one of these chicks on the day after hatching, as it had not been fed by the female (she appeared not to feed her chicks on the first day). In future nests in which the young were parent-reared, the young were fed entirely by the parents'. Rosemary concluded: 'I continue to breed this delightful little lory at Palmitos Park. This year (1993) four young were hand-reared and one parent-reared from our only pair'.

Malcolm Ellis

* * *

LORY RELOCATION

Because its population of about 1,000 birds is located only on the tiny island of Ua Huka, 14 Ultramarine Lories *Vini ultramarina* have been translocated to neighbouring Fatu Hiva, as a safeguard against extinction, by staff from the Zoological Society of San Diego in collaboration with the French Polynesian Ministry of the Environment.

The Society initiated a conservation programme with the Ministry in 1990 and continues to play a major part in the conservation of other species on Ua Huka and other islands. Most recently it has begun a census and management planning for the magnificent Nuku Hiva Imperial Pigeon *Ducula galeata*. One of the world's largest

pigeons, weighing several pounds and measuring up to two feet in length, it is estimated that only between 150 - 300 survive in Nuku Hiva's remote valleys.

* * *

FOREIGN BIRD BREEDER OF THE YEAR

The 1993 *CAGE & AVIARY BIRDS* Foreign Bird Breeder of the Year competition, organised by that weekly journal in conjunction with the Foreign Bird Federation and John E. Haith Limited, was judged by Avicultural Society council members, Bob Grantham and Dr. Roger Wilkinson, Curator of Birds at Chester Zoo.

The results, announced recently, revealed a number of interesting breedings. Terry Cook bred 35 Purple Grenadiers *Uraeginthus ianthinogaster* and 13 Violet-eared Waxbills *U. granatina*, yet failed to win the hardbill category and instead finished runner-up. Jim Matthews, another breeder living in Yorkshire, the winner of the Parrot category, bred 13 Military Macaws *Ara militaris*, as well as other macaws and parrot species.

Philip Fisher of Norfolk, winner of the Softbill award, was particularly successful with sunbirds and bred three White-bellied *Nectarinia talatala*, two Yellow-bellied *N. jugularis* and two Scarlet-chested *N. senegalensis*. Runner-up, Roger Green bred five Rufous-vented Yuhinas *Yuhina occipitalis* (a possible first British breeding). Other species bred by him include four Plumbeous Redstarts *Phoenicurus fuliginosus*, three Siberian Thrushes *Zoothera sibirica* and four Chestnut-capped Thrushes *Z. interpres*.

In Essex, Charlie Mott succeeded in breeding six species of fruit pigeons: two Magnificent *Ptilinopus magnificus*, three Pink-spotted *P. perlatus*, three Jambu *P. jambu*, two Superb *P. superbus*, two Beautiful *P. pulchellus* and three Black-naped *P. melanospila*. Roger Cattermole, runner-up to him in the Any Other Species category, bred 208 ducks and waders, including the Spotted or Cape Thicknee *Burhinus capensis*. He also bred six Racket-tailed Rollers *Coracias spatulata*. It was following his success in 1991, his account of which was published in the *Avicultural Magazine* 1992, 98, 1; 22 - 26, that Roger was awarded the Avicultural Society medal for the first British breeding of this only recently available species.

Paradise Park at Hayle in Cornwall won the top award in the Zoo and Bird Garden section. Among the 32 species bred were 10 which had not succeeded there previously. Included were Yellow-shouldered Amazons *Amasona barbadensis*, which had four young,

Moustached Parrakeets *Psittacula alexandri*, which also produced four young, and Citron-crested Cockatoos *Cacatua sulphurea citrinocristata* with one youngster. The latter breeding coincided with the park being appointed species co-ordinator for the recently established European breeding programme for this subspecies.

Temminck's Tragopans *Tragopan temminckii* raised three young, and in the same aviary, Brazilian Scarlet Tanagers *Ramphocelus bresilius* reared three broods. Two young Argus Pheasants *Argusianus argus* were fathered by a male bred at Paradise Park in 1984. Other successful breedings were achieved with Wattled Crane *Buggeranus carunculatus* (one), Crowned Crane *Balearica pavonina gibbericeps* (two), Cheer Pheasant *Catreus wallichii* (two), Stone Curlew *Burhinus oedicephalus* (one), Bartlett's Bleeding Heart Pigeon *Gallicolumba criniger* (one), Buffon's Macaw *Ara ambigua* (three) and Yellow-fronted Woodpecker *Melanerpes flavifrons* (one).

In 1992, John Heath hand-reared a St. Vincent Amazon *A. guildingii* from an egg laid by the hen of Paradise Park's pair. More recently he raised a Palm Cockatoo *Probosciger aterrimus* for the park.

* * *

VISIT TO THE COTSWOLD WILDLIFE PARK

By Stewart Pyper (Frome, Somerset)

Almost 40 members and their guests visited The Cotswold Wildlife Park at Burford on Sunday, 13th April 1994 to view an interesting collection of birds, mammals and reptiles housed in a delightful setting at this attractive Oxfordshire park. On the day of our visit, the weather was fairly typical of what one expects in England in mid-April - sunny, but with a wind which, in exposed situations, was quite biting.

The park's birds are mainly housed in well constructed, spacious aviaries with good plant cover which allows the occupants to escape from visitors' eyes when they choose to. Many of the flights were linked to what appeared to be heated shelters.

The collection, although varied, is particularly strong on Pheasants and Touracos. A highlight in the Walled Garden is a pair of Great Blue Touracos - probably the only birds of the species at present on display in a public collection in the UK. It was the first time I had seen the species in an outside flight.

In another aviary, a single White-crested Touraco was admired. Again, this bird and its mate (incubating at the time of our visit) are the only examples of the species to be seen in a zoo or bird garden in Britain. Elsewhere, a single Ross's Touraco was awaiting a mate.

Notable among the Pheasants were Satyr and Temminck's Tragopans, Reeve's, Kocklass and Monals. Another interesting member of the *Phasianidae* at Burford is the Capercaillie.

Toco and Red-billed Toucans are in the collection, as are various parrotlike species which include an odd Electus, Macaws, Double Yellow-headed Amazons, Cockatoos and a colony of Love-birds.

The Tropical House had had its vegetation cut-back and as a result we had good views of Banded Rail, Luzon Bleeding-heart Pigeons, Silver-beaked Tanagers, Andaman and Philippine Starlings, and a colony of Zosterops.

Aviaries in the Walled Garden (where the Tropical House is located), are very well sheltered and a pair of Collared Starlings was incubating in an aviary they shared with Grey Peacock Pheasants and Black-throated laughing Thrushes. Other aviaries housed Pileated Jays, Kookaburra, Rothschild's Grackles, Scarlet and Waldrap Ibis, Black Storks, Red-tailed Laughing Thrushes, Common Bronze-winged Pigeons, Bamboo Partridge and Great Indian

Hornbills (the female was being muddled in at the time) together with a variety of Waterfowl. It is hoped a pair of Demoiselle Cranes will be kept at liberty in the Walled Garden.

Outside the Walled Garden are aviaries containing various owls, while on the lake are Nene and Red-breasted Geese. The owls in particular seem to fascinate many visitors.

All the birds looked in good health in their spacious accommodation. Our thanks go to the park's manager, Colin Fountain and his keepers who answered all the questions put to them and helped make the day successful. I even met our editor's son, Michael Woolham who is on the staff at the park.

* * *

LETTERS TO THE EDITOR

Sir,

Re: Visit to Flimwell Bird Park

I would like to correct the item in Volume 100, No. 1, 1994 (page 55) of the *Avicultural Magazine*. I was in fact one of the nine members who requested a place at the above meeting, and subsequently attended on the day.

Although Dr. and Mrs. Player were understandably disappointed by the poor turnout, they made me most welcome. I enjoyed a delightful and informative morning in their company and would like to thank them again for their hospitality.

The only consolation one can draw from this meeting is that the other eight guests missed a great day out.

D. Thorneycroft

* * *

Sir,

In the final paragraph of my letter to the Editor (*Avicultural Magazine* 1993, 99, 4; 213 - 214), I passed on details of how photocopies of articles in journals can be obtained from the British Library through British Council offices abroad and concluded: 'I wonder if this service is available to us here in Britain?'

Nicholas Gould, Editor of *International Zoo News* was kind enough to write to tell me that he believes such a service operates through our local public libraries, though it is several years since he has used it. I wrote to Cornwall Libraries and Arts Department and, getting no reply to my enquiry, I heeded Nicholas's advice to be politely insistent if they tried to fob me off. I wrote to the council's Chief Executive and soon received a reply.

There is no problem obtaining photocopies of scientific papers from local public libraries I am assured. Moreover, the small charge of 50 pence for each paper is surprisingly cheap by to-day's standards. Apparently, although the copy remains strictly the property of the British Library, arrangements can be made to retain it.

The end of the third paragraph of my earlier letter somehow went a little awry. The final point I was attempting to make about the Red-billed Parrots *Poicephalus rufiventris*, which were rescued from bulldozed Baobab trees and hand-reared, was that the wildlife officials who insisted on releasing them seemed less concerned about *where* they were set free. I think that it was simply a matter of opening the door or doors and letting them go then and there ... not in eastern Kenya where they live, but well to the west in the habitat of the Brown Parrot *P. meyeri* where, unless I am mistaken, there are no Baobab trees.

Malcolm Ellis

DONALD RISDON

Aviculture in general, and particularly the Avicultural Society, lost one of its most respected names with the death on 24th April 1994 of Donald Risdon. He was 82 and is survived by his wife, Betty and stepsons, Keith and Andrew Glenn.

He was widely known in avicultural circles both here in Britain and overseas, and for many aspiring birdkeepers with a preference for exotic species, particularly during the 1950s and 1960s, 'D.H.S. Risdon' - author of several successful books including '*An Introduction to Birdkeeping*' and '*Foreign Birds for Beginners*' - was required reading. His books still grace many an avicultural bookshelf. These works, and the many authoritative articles he wrote for various publications including the *Avicultural Magazine*, provided the main outlets for the enormous reservoir of avicultural experience and knowledge he possessed.

Donald Risdon joined the Avicultural Society in January 1934 and was elected to the Society's Council in 1946. In 1973 he was elected a Life Vice President in recognition of his commitment to, and endeavours on behalf of, aviculture over much of his lifetime. He was awarded the President's Medal by the Society in 1989.

He contributed many articles to the *Avicultural Magazine* between 1941 and 1990. The first of them appearing in 1941 when, as a young Flight Lieutenant in the Royal Air Force, he found himself serving on the Gold Coast - a wonderful posting for any serviceman with Donald Risdon's interest in birds.

And birds were to remain a major interest in the years after World War II when he joined Edward Boosey and Alex Brooksbank as a Director of what was then Britain's best known and most reputable exotic avicultural bird business - Keston Foreign Bird Farm in Kent.

Many members will remember this bird farm and it is interesting to reflect on how much influence its concepts have had on present day public bird gardens, including the Tropical Bird Gardens at Rode (Somerset), established by Betty and Donald Risdon, which opened in 1962 - the first of its kind in the UK.

I had the pleasure of meeting Donald Risdon on just three occasions, twice at the National Exhibition of Cage Birds and more recently at Rode. He was unfailingly courteous and ever-willing to proffer advice ... if asked. There is not the slightest doubt that a man of Donald Risdon's qualities will be greatly missed by all who knew him - and by many more whose only contact was through reading his books and articles. On behalf of all members of the Avicultural Society, condolences are extended to his family.

F.W.

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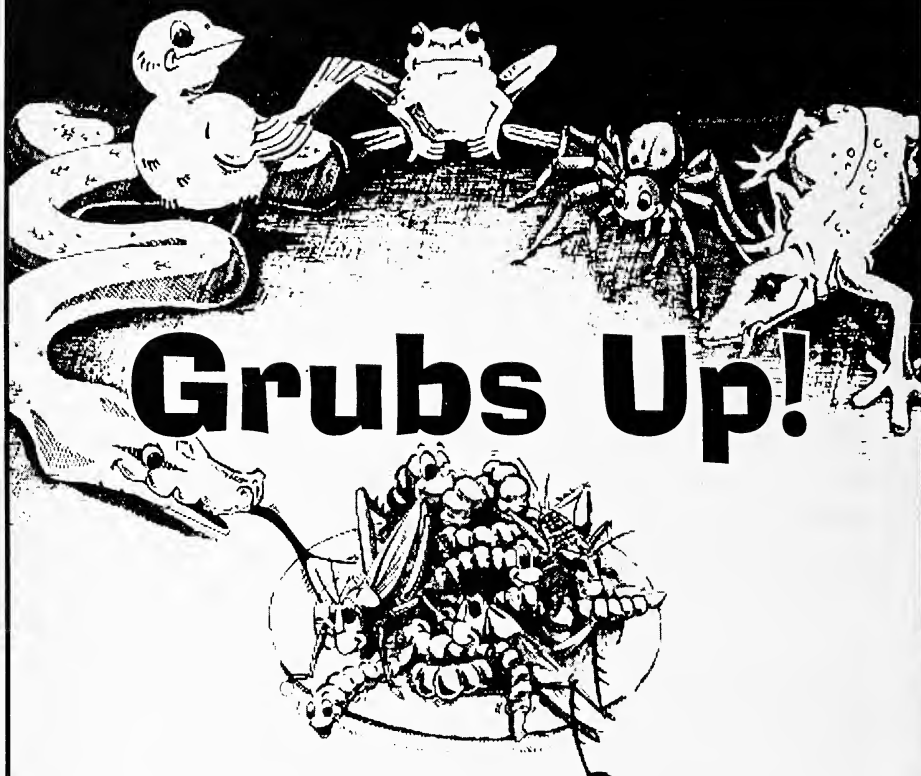
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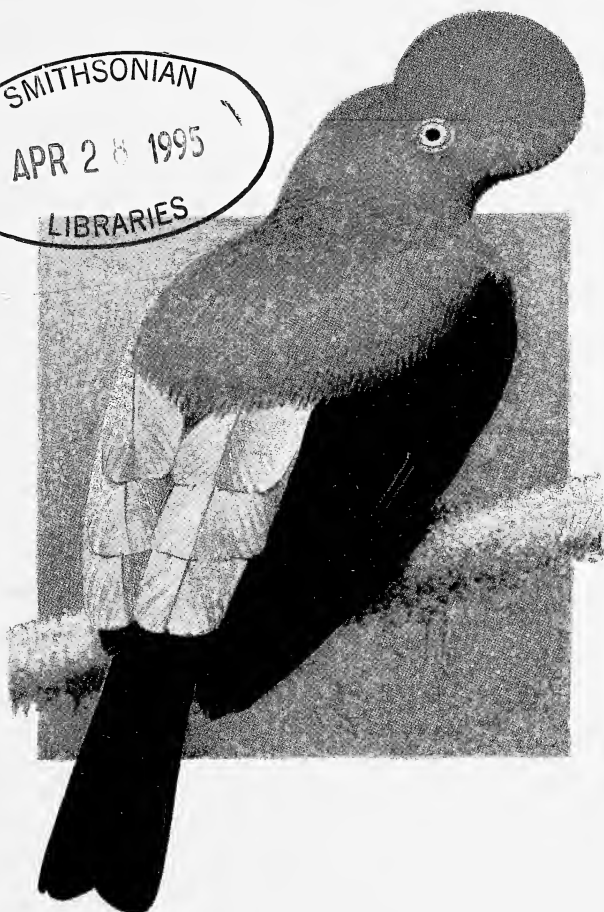
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MICULTURAL MAGAZINE



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No. 3
1994

CENTENARY YEAR

THE AVICULTURAL SOCIETY

The Avicultural Society was founded in 1894 for the study of British and foreign birds in freedom and captivity. The Society is international in character, having members throughout the world.

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THE JOURNAL OF THE AVICULTURAL SOCIETY

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EDITORIAL

The Centenary Celebration Weekend held at Bristol Zoo on 10th and 11th September was, by all accounts a considerable success. 'Good food, good company, excellent organisation and a panel of interesting speakers' effectively sums up the comments and other communications which followed the occasion.

Thanks are undoubtedly due to Geoffrey Greed, Director of Bristol Zoo, and the Avicultural Society's Honorary Secretary and Treasurer, together with those members of his staff who contributed so much to the event's smooth running. Council Member Ken Lawrence also put in a considerable effort to gather together a first-class panel of speakers for the opening day's Symposium.

All of the papers given on that occasion were taped 'live' and now await transcribing. I hope it may be possible in the not too distant future to publish the results as a special supplement for members, rather than including them in this year's final issue of the *Avicultural Magazine* (which will be published in December) to the exclusion of a number of interesting articles which are scheduled for publication at that time.

Material has been coming in at a good rate over the past 12 months, but more is needed if a high standard of content is to be maintained and I look forward to receiving material from members in the UK and overseas in the future.

It is interesting to reflect that the magazine started life 100 years ago with just eight pages per issue, although this number was doubled during the second year.

At various times over the ensuing years, its Editors have struggled to find sufficient material to fill its pages. But there were also other problems.

In the magazine's 75th Anniversary Special Supplement, published in November 1969, C. J. O. Harrison, then Assistant Editor,

wrote an amusing account of some of the trials and tribulations experienced during the publication's early days. Members who do not have that particular issue may be as amused as I was to read the following extract:

'The magazine started off a little rashly with the offer, in the opening statement reproduced in this magazine, for advice to be given on all matters by correspondence. This appears to have produced an embarrassment of material since already, at the beginning of the second number in December 1894, the Secretary was apologising for having to omit letters through lack of space. There was also an indication of early financial stringency when, at the same time, he added "Mr. Sergeant has very kindly sent me a charming design for the cover of our magazine but the Treasurer tells me that he has not sufficient funds in hand to make use of it at present. The cost of the block would £1. 16s. 0d. Will any of our wealthier friends come to our assistance?" Since the cover used for the first number continued to be used for several years we must conclude that they wouldn't.'

It was clearly hard going in those days!

F.W.

THE PAINTED BUNTING

By Luca Limongelli
(University of Rome "La Sapienza", Italy)

The Painted Bunting *Passerina ciris* belongs to the group of colourful buntings *Passerina* supp. included in the subfamily Cardinalinae, family Emberizidae. The *genus* is characterised by pronounced sexual dimorphism, small size, bright colours, and the absence of the conspicuous crest of cardinals. The Painted Bunting's breeding range includes the warmer regions of south-east United States and Mexico, reaching from North Carolina to the north to the Yucatan Peninsula to the south. During the fairly wide winter migration this species moves to the Gulf Coast, Guatemala, Cuba and Panama.

The *Passerina ciris* male is one of the most colourful American birds. The head, nape and sides of the neck are deep violet blue that contrasts with the red eye ring; throat, rump and chest are bright red; the back is yellowish green; wings and tail are bronze brown. The female and juveniles are bright grass green with lighter underparts. The males keep their juvenile plumage until the second moult. Despite the bright colours of the male, Painted Buntings are difficult to see in the wild because of their shy and secretive behaviour. Only during the breeding season is it possible to spot the males, singing loudly from a high exposed perch. The song is a melodious warble that can be produced also during flight. Like the Nightingale *Luscinia megarhynchos*, male Painted Buntings sing also at night.

These birds prefer edge habitats. They can be found in shrubs, hedgerows, weed fields, woodland edges, along water courses, in gardens. They feed on mature and immature seeds, and on insects. They build their nest in shrubs and bushes, usually not far from the ground.

Being a native species, Painted Buntings are protected in the United States and are imported only rarely in Europe, probably from Mexico. Because of their song and beautiful colours, males were imported in larger numbers than females and reproduction in captivity was never systematically pursued. I purchased a pair of these birds in spring 1989 from a pet shop, and that was the last time I saw recently imported birds of this species.

In the literature it is usually said that Painted Buntings are cold-

sensitive. Therefore, initially, the pair was housed in an indoor cage. They adjusted quite easily to life in a small cage, though they never became tame nor tolerated people coming too close. They were fed an exotic and canary seed mixture, some mealworms and fruit (orange, apple, pear, all of which they often ignored). They bathed twice a day, but their plumage did not recover from the stressful period in the pet shop until the following moult. In my four years experience with this species, in order to maintain the red colours of the male, I found out that colour feeding is essential, unless it is possible to provide the birds with plenty of live food and dark soft berries like those of *Sambucus nigra* and *Phytolacca decandra*.

From 1990 on, the birds were housed in a mixed collection in a planted outdoor aviary. Winter cold (in Rome the temperature only occasionally drops below 0° C) did not seem to be a problem. In this setting, the birds gained in health and attempted to breed in August 1990. This attempt was unsuccessful, since, within 5 days, the only nestling was thrown out of the nest and died. In 1991, the pair did not attempt any further nesting, probably because they were provided with live food only occasionally. In 1992, the pair had two broods and three nestlings (2 females and 1 male) were reared to independence. In 1993, the adult pair did not attempt breeding. A pair of yearlings (the second yearling female had escaped) bred twice but the nestlings always died within 5 days from hatching. Table 1 shows the data relative to the broods carried out by my first pair in 1992, and by the pair of yearlings (brother and sister) in 1993. The unsuccessful results of the younger pair is probably related to a dietary mistake (probably a calcium deficiency) since the birds were actively feeding the nestlings.

This species is overall not difficult to cater for, even in the case of subjects that have been wild caught, as was my first pair. There are, however, some requirements that are essential for successful breeding, as my inconsistent breeding records demonstrate.

During the winter the birds are very quiet and shy. They spend much of their time in the thick cover offered by a *Thuja occidentalis* plant. They eat mealworms if available but would not go immediately to the floor of the aviary to get them. They are quite peaceful towards each other and other species. During winter (after the moult) it is even possible to house more males together.

In April, when the temperature stays over 15° C most of the time and days are longer than nights, the male starts singing quietly from a bush and gets more aggressive towards fast flying birds which it

chases at full speed. This behaviour might seem aggressive, but the bird does not attack its "victims", rather it just plays at pecking their tail, when they try to escape. In fact, birds that do not accept the chase and hold their ground are not attacked and the bunting rapidly loses interest. Apart from this chasing, the male is tolerant towards other birds. It is also interesting to note that during the whole breeding season, the male spends a great deal of time singing loudly and flying around the aviary, often in circles, and it gets more and more excited when there is another male in sight.

As the season progresses, the song of the male becomes louder, while the female starts exploring possible places to nest. Sometimes, the male enters one of these secluded spots and utters a peeping sound, trying to attract the female there. In this phase, the courtship of the male also includes going to the ground and tightening all the feathers against the body, with lowered and vibrating wings. This posture evidences the bright red eye ring. When the female starts uttering often a rhythmic sound, mating and nest building soon follow: every now and then, the male stops singing and flies fast towards the female with a peculiar call, with all the red feathers of the chest fluffed up, and slowly tries to land on her back to copulate. If the female is receptive, she will raise her tail and accept copulation.

The female builds the nest with dried leaves, petals, and twigs for the centre layers and coconut fibres for the inner lining. The female takes care of nest building, brooding and feeding the chicks. The male participates in feeding the nestlings only in the last days before fledging and until weaning.

In order to breed Painted Buntings in captivity, it is necessary to provide them with abundant live food, both for stimulating the onset of breeding behaviour and as food for the nestlings. The parents feed the nestlings exclusively with one insect at a time carried to the nest in the beak (i.e. they do not regurgitate food). I provided the birds with waxmoth larvae *Galleria melonella* (which are more nutrient and digestible) and mealworms *Tenebrio molitor*. Soon after hatching the larvae have to be cut in smaller pieces in order to "fit" into the nestlings' gape. Such food is unbalanced in vitamins and minerals. It is therefore useful to sprinkle the cut larvae with some mineral and multivitamin preparation. When the nestlings are 6 - 7 days old it is also possible to provide the parents with germinated hemp and soaked egg food. When the insects are finished the female might feed the nestlings with dehusked sprouted hemp seeds or with small pieces of egg food.

Overall, the live food for the nestlings must be provided to the parents very often (every hour and a half approximately) and possibly in small amounts, from dawn to dusk. This schedule is unavoidable for waxmoth larvae (which are also the most important food for the nestlings), but with cut mealworms it is possible to give bigger amounts less often since these insects do not dry quickly, even in the sun, and therefore are accepted by the birds for longer periods.

Fledging takes place at 10 - 12 days from hatching, when the young birds are still not able to fly. Both parents feed them until weaning, which takes approximately one month. Even when the young are able to eat seeds, they would still beg for insects from their parents. Peculiarly however, they seize the insect from the parent's beak and eat it by themselves, as if practising how to handle insects. Before the fledglings are fully independent, the female already invites the male for copulation, and starts building a new nest.

Painted Buntings are beautiful birds. They are not often cited in avicultural literature, because of their breeding requirements which are similar to those of softbills. I believe that this species represents an intriguing alternative to more popular and less challenging seed-eaters. It might be a valuable effort if European aviculturists could contribute to the general knowledge about its ethogram and its requirements in captivity. Its behaviour is complex and its colours are gorgeous, why not dedicate more effort to establishing it in captivity?

Table 1

BroodEggs	Laid	Fertile	Brooding time	Eggs hatched	Fledging
May 92	2	2	12	2	12
May 92	3	3	13	1	10
June 93	3	2	12	2	
July 93	3	2	12	2	

Data refer to 2 different pairs that reproduced in different years. Time is expressed in days.

* * *

COLONIAL BREEDING OF LESSER PATAGONIAN CONURES

By W. D. Clarke and Adriana Clarke Marcheggiano,
(Rome, Italy.)

The Lesser Patagonian Conure *Cyanoliseus p. patagonus* (Vieillot) is a colourful large parrot, 45 cm. long, with a long tail and rather small bill. Head, neck, back and scapulars are olive-brown; rump, upper tail, lower back and underparts are yellow; thighs and centre of abdomen are orange-red.

There is no sexual dimorphism and young birds closely resemble adults, the only visible differences being the eye (iris black; it is yellow in adults) and the upper part of the bill of a distinctly whitish colour (black in adults).

These conures inhabit open country in the southern part of central Argentina (J. M. Forshaw 1973, Reichenow 1955), nesting in colonies in burrows excavated by them in limestone or sandstone cliff faces.

In the early Autumn of 1990 we found that a local dealer had imported from Argentina a small number of Lesser Patagonian Conures and, on impulse (possibly strengthened by the strangely reasonable price), we bought as many as we could, 16 individuals, with the secret hope of trying to breed them.

Our birds were all wild-caught adults, and were temporarily housed in a rather small outdoor aviary 3 x 2 x 2 m. high, where they very slowly calmed down and began to get accustomed to their new food and to us. They were so frightened at first that they refused to eat for the first four days.

We then decided to build a large aviary, specially adapted to their needs, and planned a 8 x 6 x 2.5 m. high flight.

Taking advantage of a slope in the ground in our garden, we dug a sort of terrace, so that the north side resulted in a natural wall 2.50 m. high and leaning to this we built a tufa limestone wall.

In the upper part of this wall we made 8 holes 8 x 16 cm high, connected by 30 cm. long passages to 8 rear cubic "chambers" measuring (inside) 50 x 50 x 50 m.

These "chambers", also made of tufa limestone (the cheapest building material in Latium), were embedded in the ground behind the wall, with the upper (roof) side resulting 30 cm. below ground level.

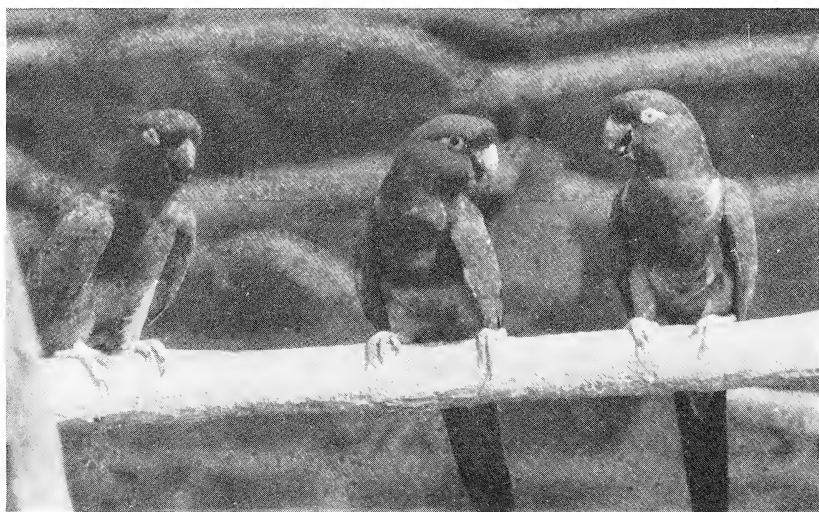
Of course, in our intention, the "chambers" were to serve as nests for our conures. On the floor of the "chambers" we put a 15 cm. layer of damp earth. To protect the aviary from rain and cold we partially covered it with transparent fibre-glass sheets.

Being a self-made aviary it took a very long time to finish and we at last put the conures in their new home in march 1992. The birds were immediately attracted by the holes in the wall, much to our satisfaction, and very soon began to enter them, shortly adopting the habit of roosting inside the nests. There was no breeding activity in 1992, as we had expected, the birds having been put in the new flight too late in the season.

Things changed in 1993, when, after a very severe winter, pairs began to be easily identified by mutual preening and feeding.

Each pair invariably entered the same nest-hole, defending its entrance against the other birds. At the end of March the first mating was observed.

Then followed a very long time without visible news; the birds just "chattered" more than usual in the afternoon and even at night. In May and June we observed that a lot more food was taken and that never more than six birds were out of the nest-holes at the same time.



Young Patagonian Conure *Cyanoliseus p. patagonus* one hour after leaving the nest

On 4th July, 1993, we heard a great commotion coming from the conures' flight at about 10.00 am, and, going to have a look, we saw

a lot of birds out of the nest-holes, and immediately began to round them: there were 17! Looking closer we soon identified the young bird by the colour of its bill: whitish instead of black. A more careful look showed that the young differed from adults also by the colour of their feet: grey instead of pink, and we could not find this characteristic described elsewhere in literature.

It was the first young bird to come out, soon to be followed, to our surprise and delight, by eight more coming out of the nests, respectively and one by one, on 6th, 16th, 22nd and 25th July and on 4th, 5th, 16th and 24th August.

All the young birds came out of the nests completely and perfectly feathered, with no signs of down; they were a bit awkward when flying for the first two days, very quickly improving and often re-entering their nest.

The parents were very caring, always near their chick, (see photo, taken one hour after the first chick came out), specially assisting in "perching" and "landing", loudly calling before feeding the nearby chick (which never uttered a feeding sound) and using a new call which, curiously, we never did hear in the months in which the chicks were inside the nests.

On this point, we have observed in many years of breeding experience with many different genera, that when adult wild-caught birds finally do breed, there is almost absolutely no sound and/or activity coming from the nests until the young come out, as it happens in the wild for protection against predators. On the contrary, tame pairs of the same species are very vocal and noisy when breeding and in the nests, not to mention the chicks, often screaming for food and attention.

It is worth mentioning that after 4 months, it is very difficult to distinguish young from adults.

Final considerations:

Keeping in a large aviary a number of adult wild-caught, unmarked and unsexed parrots offers, in our opinion and experience, the following advantages and, of course, disadvantages.

Advantages:

- after settling down, pair formation is natural, fast and easy (mutual choice)
- nesting is relatively easily induced when, in a large aviary, proportioned to the number, species and size of birds housed, a suitable number of nests of the type used by the species in the wild (in this case deep holes in a wall) is offered.

Disadvantages:

- it is nearly impossible to distinguish the birds: pairs, sexes and even youngsters when they mature
- the nests cannot be inspected in the breeding season
- therefore, scientific observations are almost impossible: number of eggs laid, number of chicks, incubation length, how long the chicks remain in the nest, for how long the parents feed the chicks after leaving the nest, etc.

Bibliography

- FORSHAW, M. Joseph. *Parrots of the World*, Lansdowne Press, Melbourne, 1973.
- REICHENOW, Anton. *Vogelbilder aus Fernen Zonen - Papagaien*. Revised by J. Steinbacher, Verlag Gottfried Helene, Pfungstaf/Darmstadt, 1955.
- PETERS, J. L. *Check list of Birds of the World*, vol. 3; Harvard University Press, Cambridge, 1937.

* * *

THE PARROTBILLS

By Bill Timmis

(Curator, Lotherton Hall Bird Gardens, Leeds.)

Among the many groups of birds rarely kept in European and American avicultural collections, are the Parrotbills, as known in Indian ornithology, or crowtits, as in Chinese ornithology. With one exception, this is a group of very distinct passerines with very short, high-arched bills giving the birds a superficial resemblance to parrots and none whatsoever to either crows or tits.

Counting the well-known, thin-billed Bearded Reedling *Panurus biarmicus*, which certainly belongs with this group, there are at least 17, at most 24, species the exact number depending upon the taxonomic viewpoints of those dealing with these birds at species level.

Parrotbills range geographically from the high western Himalayas eastwards through western China and "Further India" to East Manchuria, Korea, Taiwan and south to the hills of south Annam where there is an isolated population of one species; the northern *Panurus* has a spotty range in reedbeds from western Europe to Manchuria and north China. Parrotbills are absent from the Eurasian tropics, Japan, Africa and Australasia.

Not one species of parrotbill has succeeded in reaching and establishing itself even in western North America where many species of birds, mammals and butterflies of unquestioned Eurasian origin are established, such as the Rosy Finches *Leucosticte*, the bighorn sheep *Ovis* and the Parnassius butterflies *Parnassius*, to cite three examples. (It should be noted that the well-known Wren-tit *Chamaea fasciata*, of west Oregon and Californian brushlands, appears to be the New World representative of that Timaliine group of genera which includes *Chrysomma* and *Moupinia*).

With the exception of the two reedbed species - Bearded Reedling and Heude's Parrotbill *Paradoxornis heudei* - these are birds of subtropical, warm and cool temperate hill and montane forests with understoreys of bush cover and, most importantly, bamboos of different species varying in stem thicknesses in the zone where temperate and tropical Eurasia meet with a most remarkable intermingling of plant and animal species of both temperate and tropical origins. Only in China, Manchuria and Korea does a non-reedbed Parrotbill reach the lowlands.

Apart from *Panurus* in marsh and lacustrine reedbeds in Turkestanian deserts, no parrotbill occupies any arid region habitat. Altitudinally, parrotbills range from about 600 m. up to 3600 m. and with some species even up to 4000 m., in the Himalayas, western China and the hill tracts of Assam, Burma and the Indochinese lands; association with bamboos is usual with parrotbills, though Webb's *P. webbianus* appears more eurytopic than other parrotbills in this respect. The bill of the thick-billed species (all except *Panurus*) is adapted to ripping holes in bamboo stems to extract insects. Lynes (1914) describes this food-getting method for Heude's Parrotbill and it is safe to assume that all parrotbills use the same method for food-getting from bamboos. Food is insects, seeds and other forms of vegetable matter for all parrotbills.

In colouration and patterning, parrotbill species are in two groups. The first, comprises small to medium sized birds which do not ascend high altitudes (except *fulvifrons*), and are patterned in different colours - browns, light reds and whites being involved with foreparts including head and throat usually of contrasting colours including black. Grey crowns are present in five species of this first group - *Panurus biarmicus*, *Paradoxornis heudei*, *P. przewalskii*, *P. nipalensis* and *P. gularis*. This grey crown appears to be a "primitive" character which has been lost through browning or reddening of crown in the species most closely related to *nipalensis* - *verreauxi*, *fulvifrons* and *davidianus*, and to *gularis* - *atrosuperciliaris* and *ruficeps*.

The isolated *margaritae* of south Annam is the only form of parrotbill with a black crown; it is very difficult if not impossible to say whether this black crown was evolved in an isolated population, or whether it is a relic from an ancestral parrotbill stock which had this character, subsequently lost through evolution into grey then into brown or red. Deignan (1964: 442) treats *margaritae* Delacour 1927 as conspecific with *gularis* Gray 1845. The second group of parrotbill species including the *webbianus* complex and the large species of the *oemodius* - *unicolor* - *paradoxus* species group, is generally unicoloured without any contrasting patterns except for greyish head in *P. zappeyi* which is a west-central Sichuan endemic apparently nearest to the *oemodius* group, although about the same size as the birds of the *webbianus* complex. Essentially, this second species group is Chinese and high Himalayan.

Bill colour in parrotbills goes from deep orange-yellow and

yellow to horn and brown; the commissure is strongly sinuated in some species. Eye-rings are present in the large *P. paradoxus* and the small *P. conspicillatus* - and it should be noted that the depth of unicolouration tone in the smaller species and also in *zappeyi* is the darkish tone of the large parrotbills and not that lighter brown of the *webbianus* complex.

In passing, it should be pointed out that Traylor (1967: 54 - 57) studied the *webbianus* complex and concluded by suggesting that three geographically representative species be recognized - *brunneus*, *webbianus* and *alphonsianus*.

All parrotbills possess four toes on each foot with one exception: *paradoxus*. This character neither invalidates the relationship between *paradoxus* and *unicolor*, which form a partially overlapping species-pair, nor warrants the erection of a monospecific genus *Cholornis* (Verreaux 1870) upon the strength of this one character alone. No parrotbill has green or yellow in the plumage colour.

In life, parrotbills are rather shy, gregarious and skulking birds moving about in parties through bushes and bamboos with a lack of inquisitiveness remarkable in a group which has been, and is, regarded as a subfamily of the Timaliidae - which contains the laughing thrushes *Garrulax*, babblers *Turdoides* and others which are notoriously noisy, unshy and inquisitive birds. The voice of the largest species - the Great Parrotbill *P. oemodius* - has been described as a harsh croaking like *Turdoides*; that of Heude's has been only described in winter by Lynes (op.cit.) from flying birds as a perpetual trill.

The other reedbed species, the Bearded Reedling has the well-known "ping-ping", "tic-tic" call notes, well described in the literature (i.e. Witherby 1938) in addition to churrings which together with chirrups and bleating sounds appear to be characteristic call notes of all the *Paradoxornis* species.

While the nests and eggs of several parrotbill species appear to be still undescribed, all known nests are deep cups constructed of reed or bamboo leaves and are sited among reed or bamboo stems in reedbeds and bamboo thickets, the eggs being white or blue and white in ground colour. Streaks and specklings of darker colour have been described as present on the eggs of some species such as *Panurus*, the *Paradoxornis flavirostris* - *guttaticollis* species pair and also for *P. oemodius*.

Though parrotbills are a very distinct group of passerine birds, being a specialized offshoot from the general Old World insect-

<i>P. gularis</i> Gray 1845	Sikkim - south-east China, Hainan, western Burma, Annam
<i>P. atosuperciliaris</i> Godwin-Austen 1877	Sikkim - western Yunnan and northern Laos
<i>P. ruficeps</i> Blyth 1842	Nepal and Assam hills - central Tonking
<i>P. flavirostris</i> Gould 1836	Nepal - Assam and Chin Hills of western Burma
<i>P. guttaticollis</i> David 1871	Assam hills - southern China to Fujian
<i>P. webbianus</i> Gould 1852	central China - Manchuria, Korea and Taiwan
<i>P. ricketti</i> Rothschild 1922	north-west Yunnan
<i>P. alphonsianus</i> Verreaux 1870	Sichuan - north-west Tongking
<i>P. brunneus</i> Anderson 1871	northern Burma - Yunnan and northern Tongking
<i>P. zappeyi</i> Thayer & Bangs 1912	mountains of west central Sichuan, western China
<i>P. conspicillatus</i> David 1871	Tsinghai - western Shensi, western China
<i>P. unicolor</i> Hodgson 1843	Nepal - western Sichuan
<i>P. paradoxus</i> Verreaux 1870	western Sichuan - southern Kansu and southern Shensi
<i>P. oemodius</i> Hodgson 1842	Garhwal - western Sichuan

REFERENCES

- ALI, S. & RIPLEY S.D. 1971. *Handbook of the Birds of India and Pakistan* Vol 6. pp.xvi + 245. Oxford University Press, Bombay.
- CHENG, T. H. 1976. *Distributional List of Chinese Birds*, pp xvii + 1218 Peking, China.
- DEIGNAN, H.G. 1964 Panurinae, pp. 430 - 442, in: E. Mayr & R. A. Paynter Jr. (eds) *Checklist of Birds of the World* vol X, pp. ix + 502 Cambridge, Mass., USA.
- GADOW, H. 1883. *Catalogue of the Birds in the British Museum* vol.VIII, pp. xiii + 285 London.
- HARTERT, e. 1907. *Die Vögel der Paläarktischen Fauna* Heft IV, pp. 385 - 512 Friedländer und Shon, Berlin.
- HELLMAYR, C.E. 1903 Paridae, Sittidae und Certhiidae in: F.E. Schulze (ed) *Das Tierreich* 18 Lieferung. pp.xxxi + 255 Friedländer und Sohn, Berlin
- LYNES, H. 1914. *Some Notes on the Habits and Distribution of Paradoxornis heudei* David, Ibis series X, 2: 177 - 185.
- SHARPE, R.B. 1883. *Catalogue of the Birds in the British Museum* vol. VII, pp. xvi + 698, London.
- TRAYLOR, M. A. 1967. *A Collection of Birds from Szechwan* Fieldiana Zool. 53: 1 - 67.
- WITHERBY, H. F., JOURDAIN, F.C.R., TICEHURST, N.F. & TUCKER, B. W. 1938. *The Handbook of British Birds* vol. 1, pp. xl + 326 H.F. Witherby Ltd. London.
- YEN, K. Y. 1936. *Revision Systematique de la Famille des Paradoxornithides* Sci. Journ., Sun Yat-sen Univ., Canton, 7: 1 - 43.

BREEDING THE ORANGE-BREASTED FIG PARROT AT LORO PARQUE

By Roger G. Sweeney (Avian Consultant, Loro Parque)

The Orange-breasted Fig Parrot *Opopsitta gulielmiterti* occurs naturally on New Guinea, including Salawati in the Papuan Islands, and also the Aru Islands, Indonesia. Seven subspecies have been described, although this figure may be in need of a slight revision. Perhaps the most distinctive is *Opopsitta gulielmiterti amabilis*, which occurs from the North-eastern region of New Guinea. This subspecies differs very noticeably from others by the fact that adult males lack the distinctive orange colouration of the breast and upper abdomen, which is instead pale yellow. The male also lacks black marking on the ear coverts usually present in other subspecies. The female, by comparison, has the black ear coverts and also the rich orange breast and upper abdomen coloration, making sex identification for this subspecies the reverse of the nominate description and most of the other subspecies.

The Orange-breasted Fig Parrot has been represented in the Loro Parque collection by the subspecies *O. g. amabilis* for several years, although recently these birds have not been on public display but are accommodated in one of our off-exhibition breeding areas. One pair of *O. g. amabilis* at Loro Parque, which are housed in a breeding cage in one of our off-exhibition areas, successfully hatched and parent-reared a chick during the early part of the 1994 breeding season. Some of the notes recorded are as follows.

The breeding cage is situated in an off-exhibit area which is not accessible to members of the visiting public. The cage measures 2.93 metres in length, 1.00 metres in width and 2.36 metres in height. One end is covered and has solid walls, while the middle and far end are of more open wire framework design. The birds have visibility into the adjoining cages, but the pair in question are not housed within visibility distance of other *Opopsitta* pairs.

The adult pair are fed throughout the year twice each day - once early in the morning with a second feed provided during the middle of the afternoon. In the case of this subspecies, both feeding periods provide the same foods. A main dish offers a mixture of various chopped fruits and vegetables, alfalfa, palm fruits and fresh figs. A second dish, also provided at each feeding period, contains a commercial dietary pellet, a mixture of small dry millet, niger and

canary seeds, a canine pellet, a special supplement cake which is made at Loro Parque, and live food in the form of mealworms.

Throughout the year the diet is supplemented with a general vitamin/mineral powder, plus a small amount of additional Vitamin K in powder form.

When the time is approaching for chicks to hatch in the nest box the diet is then supplemented daily with *Lactobasillus*, a powder form being sprinkled over the food. This is continued until the chicks fledge. I have now used similar dietary guidelines to these to successfully rear both species of *Opopsitta* and all three species of *Psittaculirostris* in captivity.

A choice of three different nesting sites was provided within the cage. A small conventional shaped nestbox, an L-shaped nest box and a third nest made from a hollowed out section of palm log. In the event, the pair selected the conventional style of nest box in which to breed. It measured 30 cm in height and 15 cm in both width and length. The entrance hole had a diameter of 5.5 cm. This nestbox is situated in the more secluded end of the cage, while the palm log and the L-shaped nestbox are located at the opposite end of the cage which is more exposed. Wood shavings are used exclusively to provide a nesting medium within the nestbox.

On 23rd February 1994, the nestbox was inspected and found to contain two eggs., These were incubated for the full term by the parents and were not unduly disturbed for inspection until they had become overdue. On the removal of the eggs from the nestbox they were examined and found to be infertile.

The next breeding attempt followed in April when the female again began brooding and the nest box was inspected and found to contain an egg on 18th April. Two eggs were laid in this clutch and they were incubated without any cause for concern about the behaviour of the adult pair. Care was taken during this time to keep any disturbance to a minimum. On 12th May one chick had hatched. The second egg failed to hatch and was later removed from the nestbox.

The single chick seemed strong and developed well with no specific problems encountered throughout its rearing period. The nestbox was inspected periodically, but this was undertaken with great care to cause as little disturbance to the adult pair as possible; the task was mainly carried out by me.

At the age of 15 days a closed band was fitted to the leg of the chick, which, by now, was very strong and the parents seemed to be

unconcerned by its handling. The chick first left the nest box on 17th June, although for several subsequent days it continued to return into the box for short periods of time throughout the day. On its emergence it resembled the adult female bird, apart from having generally duller plumage, with lighter coloration on the sides of the mandible, and by the breast and upper abdomen being a lighter, more yellowish, shade of orange. The chick continued to be fed by the adult birds for some time after it fledged, but was first seen to eat by itself five days after it emerged from the nestbox.

At the time of writing, in early July 1994, a second pair of *O.g.amabilis* have now laid eggs and they are currently being incubated in the nestbox. We believe the chances of further chicks being reared during 1994 are very good.

The population of *O. g. amabilis* at Loro Parque is growing each year and it is our intention to form new pairs from the birds reared. It is also our intention that a pair of *Opopsitta quliemiterti* will soon be placed upon public display in the Parque - once a new area of aviaries has been constructed especially for Fig Parrots (*Opopsitta* and *Psittaculirostris* genera) that will allow all five species to be housed together and bred on public display.

In the case of *O. g. amabilis*, great effort will be needed by those working with this bird in aviculture if it is to become established. To date, very few successful captive breeding results have been recorded. Continued success at Loro Parque will soon require that new blood lines need to be introduced into our breeding group and I would certainly be interested in communication with any aviculturists who are successfully breeding this subspecies and who would be willing to undertake blood line exchanges of captive-bred birds. There can be few more interesting and captivating psittacines to maintain than the Orange-breasted Fig Parrot. Its beauty, personality and intricate behaviour provide endless interest and every effort should be made to ensure that the very limited number of birds currently maintained in aviculture are properly cared for and are the basis for a potentially self-sustaining captive population.

This is a realistic goal, and it will require close co-operation and communication between everyone working with the species, I would welcome any correspondence from other aviculturists maintaining these birds at present.

BIRD NOTES FROM CHESTER ZOO - 1993

By Roger Wilkinson (Curator of Birds)

Many new developments at Chester were initiated or completed last year. Our major project was in designing and developing the new 'Europe on the Edge' exhibit. This exciting new aviary has been built on the site of the previous Polar bear and adjacent waterfowl enclosures. It features a massive cliff face with nesting areas and caves and a waterfall cascading into a river which then flows into a reed fringed pond. The enclosure occupies a ground space of approximately 2000 sq. metres and is tented over with 2" mesh polythene netting suspended from five flag poles, the tallest of which reach up to 12 metres.

The most important occupants of the aviary are the pair of European Black Vultures *Aegypius monachus*. These were moved into the new aviary in August and other species then added in turn. First we introduced White Storks *Ciconia ciconia* together with Demoiselle Cranes *Anthropoides virgo* and later Little Egrets *Egretta garzetta*, Red-crested Pochard *Netta rufina*, Marbled Teal *Marmaronetta angustirostris* and Waldrapp Ibis *Geronticus eremita*. Most recently a pair of Red-billed Choughs *Pyrrhocorax pyrrhocorax* have been released into this flight and we hope to add waders including European Stone Curlews *Burhinus oedichenus* this spring.

Other new developments in 1993 included the completion of an extremely spacious new aviary for Mauritius Kestrels *Falco punctatus* and four new owl aviaries. We were delighted to receive a pair of Mauritius Kestrels bred at Jersey Wildlife Preservation Trust in 1993 and look forward to working with these birds in 1994. We have also just started a major new reconstruction of the lower aviaries in the Tropical House. These are being effectively doubled in size by now reaching up to the top of the upper balcony and being extended further out from the wall of the Tropical House. 'Always building' was our founder George Mottershead's motto for Chester Zoo and it is excellent to see this being continued.

New species to arrive in 1993, additional to those already mentioned, include four Hoopoes *Upupa epops* bred at Harewood Bird Gardens two Tropicbird Hornbills *Penelopides panini* bred at Linton Zoo, Nicobar Pigeons *Caloenas nicobarica* from Frankfurt and Rotterdam Zoos, and Yellow-throated Laughing Thrushes

Garrulax galbanus (a pair bred at Leeds Castle and three from Raymond Sawyer). We also received on loan a pair of Secretary Birds *Sagittarius serpentarius* (the male from Marwell Zoo, the female from the Tropical Bird Gardens, Rode) and a pair of Illiger's Macaws *Ara maracana* from Mr. Jim Matthews. I was pleased to have the Illiger's on breeding loan at Chester having enjoyed seeing these delightful macaws in the wild in Brazil. We are also most grateful to Mr. Jim Murray who donated a group of Gouldian Finches *Chloebia gouldiae* to the Zoo.

Amongst our many 'adopters' were the Amazona Society U.K. who adopted our Lilacine Amazons *Amazona autumnalis lilacina*. This was particularly appropriate in that the European EEP Lilacine Studbook is now run from Chester by Mark Pilgrim and that we had our first breeding success with Lilacines this year. Two chicks were successfully reared by their parents, one has now been placed at Bristol Zoo and the other at Banham Zoo. Other parrots parent-reared in 1993 included Red-fronted Macaws *Ara rubrogenys*, Blue and Yellow Macaws *Ara ararauna*, Greater Vasa Parrots *Coracopsis vasa*, Lesser Vasa Parrots *Coracopsis nigra*, Lesser Patagonian Conures *Cyanoliseus patagonus*, Red-masked Conure *Aratinga erythrogenys*, Stellas Lorikeets *Charmosyna papou* and Musschenbroeks Lorikeets *Neopsittacus musschenbroekii*.

We were especially pleased that our second pair of Blue and Yellow Macaws were successful in their first breeding attempt. The female of this pair was five years old having been bred at Chester in 1988. We are hoping that our recently established second pair of Red-fronted Macaws, which also includes a Chester-bred female, may soon follow suit. All three pairs of Blue-eyed Cockatoos *Cacatua ophthalmica* laid eggs in 1993 but none were successful in rearing their own chicks. Our most recently established pair (which includes a Chester-bred female and which successfully reared a chick on their first attempt in 1990) have since taken to breaking their eggs. Another pair kept in the Parrot House sit tight but have not hatched chicks for ten years. Two of their eggs were transferred to the incubator this year but although one hatched, the chick was weak and failed to survive. The chick was unusual in having white down rather than the yellow down of other chicks. However that pair was successful in hatching an egg fostered under them from our third pair and this chick was successfully reared by them. Another six chicks were incubator hatched and four of these successfully hand-reared; one died at less than a month old and another on weaning.

Superb Fruit Doves *Ptilinopus superbus* were bred for the first time at Chester, a single chick being parent-reared. Other pigeons bred in 1993 included Luzon Bleeding Heart Doves *Gallicolumba luzonica*, Celebes Quail Doves *Gallicolumba tristigmata* and Mountain Witch Doves *Geotrygon versicolor*. Common Bronzewings *Phaps chalcoptera* on loan from the Tropical Bird Gardens, Rode, were also bred in 1993.

The demolition and rebuilding of the largest block of owl aviaries was completed without major disturbance of our breeding stock. White-faced Scops Owls *Otus leucotis* reared a brood of four charming youngsters and Snowy Owls *Nyctea scandiaca* and Barn Owls *Tyto alba* were also bred. An Andean Condor *Vultur gryphus* was puppet-reared - the 10th in recent years. Trumpeter Hornbills *Bycanistes buccinator* reared a brood of three chicks and our African Grey Hornbills *Tockus nasutus* produced seven chicks in two rounds. Whilst the female African Grey Hornbill was sealed in the nest with our first brood of chicks the male escaped from his aviary into the free-flight area of the Tropical House. Until he was eventually re-caught the male's role was taken by the keepers who fed the female in the nest. She accepted this without any of our anticipated problems and five fine chicks eventually fledged. Our female Great Indian Hornbill *Buceros bicornis* again sealed herself into the nest but her two month incarceration failed to result in the much anticipated breeding success. Instead she emerged in a very dirty and very weak condition from a disgustingly filthy barrel. Without the assistance of the keepers she would probably have been unable to complete her escape. Her barrel has now been replaced by another one with its entrance towards the bottom rather than the top. This nest design is based on the one successfully used at Avifauna in the Netherlands and should permit the female to more easily avoid her faeces outside the barrel. We hope the pair will accept this new nest this coming breeding season. The Wrinkled Hornbills *Aceros corrugatus* again hatched a chick in their aviary in the Bird House and reared this to almost two months old. We were extremely disappointed when this well developed chick died in the nest. Post mortem indicated pneumonia as the cause of death. Again we intend to make a number of changes in 1994 but if still unsuccessful will then try the pair in one of the new aviaries presently under construction in the Tropical Houses.

Our original pair of Channel-billed Toucans *Ramphastos vitellinus* which first bred in 1989 again had two rounds of chicks in 1993. Three were fledged from their first brood and two from the

second brood taking the total now reared by this pair to fourteen youngsters. Neither our second pair of Channel-bills (which includes a Chester-bred female) nor our Toco Toucans *Ramphastos toco* have yet attempted to nest.

Red-crested Touracos *Tauraco erythropus* hatched but failed to rear a chick. Schalow's Touracos *Tauraco schalowi* hatched two broods of chicks but because of aggression between the parents during the nestling periods these had to be removed and finished off by hand-rearing. Four Schalow's were successfully reared using this procedure.

The Kookaburras *Dacelo novaeguineae* reared a single chick without assistance but because of losses in previous years we elected to remove the chicks of Red-billed Magpies *Urocissa erthrorhyncha* and the Azure-winged Magpies *Cyanopica cyana* when 7 - 10 days old so they could be effectively treated for gapeworm *Syngamus* and kept free from re-infection. Four Red-billed Magpies, four Azure-winged Magpies and one Rothschild's Mynah *Leucopsar rothschildi* were reared in this way. Other passerines bred included Fairy Bluebirds *Irena puella*, Silver-beaked Tanagers *Ramphocelus carbo*, Silver-eared Mesias *Leiothrix argentauris*, Red-eared Bulbuls *Pycnonotus jocosus*, Superb Spree Starlings *Spreo superbus*, Emerald Starlings *Lamprocolius iris*, Java Sparrows *Padda oryzivora* and Mexican Housefinches *Carpodacus mexicanus*. White-headed Buffalo Weavers *Dinemellia dinemelli*, Royal Starlings *Cosmopsarus regius*, Red-tailed Laughing Thrushes *Garrulax milnei*, Red-cheeked Cordon Bleu *Uraeginthus bengalus* and Orange-cheeked Waxbills *Estrilda melpoda* all hatched chicks but were unsuccessful in rearing them in 1993.

Waterfowl reared in 1993 included Hawaiian Geese *Branta sandvicensis*, Ruddy-headed Goose *Chloephaga rubidiceps*, Emperor Goose *Anser canagicus*, Fulvous Tree Duck *Dendrocygna bicolor*, White-winged Wood Duck *Cairina scutulata*, Laysan Teal *Anas laysanensis*, Ringed Teal *Anas leucophrys*, Marbled Teal, Tufted Duck *Aythya fuligula*, Red-crested Pochard, Rosy-billed Pochard *Netta peposaca*, Mandarin Duck *Aix galericulata*, Carolina Duck *Aix sponsa* and Hooded Mergansers *Mergus cucullatus*. Few of each species were reared as there now seems to be little demand for these waterfowl. Black-necked Swans *Cygnus melanocoryphus* hatched their own cygnets but failed to rear these and although one Smew *Mergus albellus* was incubator hatched this was not reared. Good numbers of several pheasant species were reared but we discovered it was difficult to place many of these at

the end of the season and as with waterfowl intend to set fewer eggs in 1994. Pheasants reared in 1993 include Satyr Tragopans *Tragopan satyra*, Temminck's Tragopan *Tragopan temminckii*, Himalayan Monals *Lophophorus impeyanus*, Brown Eared Pheasants *Crossoptilon mantchuricum*, Grey Peacock Pheasants *Polyplectron bicalcaratum*, Golden Pheasants *Chrysolophus pictus* and Edward's Pheasants *Lophura edwardsi*. Satyr Tragopans and Temmincks Tragopans were allowed to sit and rear their third broods. This was good for them and especially enjoyed by many of our zoo visitors.

We currently hold five species of cranes: Red-crowned Cranes *Grus japonensis*, White-naped Cranes *Grus vipio*, Wattled Cranes *Bugeranus carunculatus*, West African Crowned Cranes *Balearica pavonina* and Demoiselle Cranes *Anthropoides virgo*. All five species laid in 1993 but eggs were infertile for all except the Red-crowned Cranes which again reared their own chick. More success was obtained with the Flamingos; six Caribbean Flamingos *Phoenicopterus ruber ruber* and one Chilean Flamingo *Phoenicopterus chilensis* were reared. One pair of Caribbean Flamingos which nested for the first time this year hatched but then abandoned their chick. This chick was taken from the nest in an apparent comatose condition but soon recovered and was hand-reared using an adaptation of the diet developed at San Antonio Zoo (for details see Kunnermann & Perry 1990). In our first few years working with Waldrapp Ibis we found that all chicks hatched by our birds died within a few days of hatching. Having now gone through a sequence of years of first hand-rearing then supplementary feeding Waldrapp Ibis chicks in the nest, we felt our adults were now sufficiently experienced to risk leaving them to attempt to rear chicks without our assistance. We were delighted that of twelve chicks hatched in our colony all but one were successfully parent-reared. As mentioned at the beginning of this article a number of the Waldrapps including one family party have since been transferred to the 'Europe on the Edge' exhibit. We look forward to observing how they adapt to this large mixed aviary where they may face challenges more similar to those in the wild.

REFERENCES

- KUNNERMANN, F & PERRY, J. 1990. Hand-rearing the Caribbean Flamingo *Phoenicopterus ruber ruber* at San Antonio Zoo. In: Olney, P.J.S. & Ellis, P. (Eds) International Zoo Yearbook Vol.29, pp 95 - 99.

BREEDING THE FIERY-SHOULDERED CONURE

By Rosemary Low (Gran Canaria)

In the 1970s a considerable number of species of lories, fig parrots and Amazons became available in aviculture for the first time. It was an exciting era, the like of which we will never see again. Indeed, the ethical aspects of importing wild-caught birds are now considered in a different light. Few would wish to return to the days of mass importation. Aviculturists must now be self-sufficient and never again rely on the importer as a source of stock. We must value the wild-caught birds in our care more highly for they are the founder stock whose offspring will be available to many generations of aviculturists.

So these days we do not expect new species to be introduced to aviculture. Yet in 1990 the Fiery-shouldered Conure *Pyrrhura egregia* appeared in Europe, almost certainly for the first time. It is a member of a family of small conures which have much to recommend them. They have attractive personalities, they nest readily and, unlike other conures, they are not noisy.

There are more brightly coloured species of *Pyrrhura* but the feature which gives *egregia* its name is very striking. The bend of the wing is fiery orange and the carpal edge is yellow-orange. Its real beauty is appreciated when it opens its wings; the greater under wing coverts are yellow and the lesser coverts are orange.

The crown is dark brown and there are a few flecks of dark red on the ear coverts. (I have not seen one like that depicted by William Cooper in *Parrots of the World* which has the ear coverts actually red.) Feathers of the lower neck and upper breast are scalloped with grey and white and those of the lower breast are grey margined with faint yellow. The abdomen is green indistinctly marked with maroon and there is a tinge of maroon around the vent. (The breast markings on Cooper's bird are not really true to life.) Primaries and secondaries are blue. The tail is dark reddish-brown above and blackish tinged with red-brown below.

It is the only *Pyrrhura* known in aviculture which has a light-coloured beak; the beak is ivory, the cere whitish, the iris brown and the feet grey. The skin surrounding the eye is white and quite extensive. Length is 25 cm (10 in). Weight is about 70 g. Of two adult pairs weighed, both the males weighed 73 g., one female weighed 69 g. and the other female 75 g. Most *Pyrrhuras* with

which I am familiar can be weight-sexed; males are slightly heavier with the exception of the Blue-throated Conure *P. cruentata* in which the female is heavier than the male. (She is also dominant!)

In appearance, the Fiery-shouldered is, in my opinion, closest to the sub-species *chapmani* of the Maroon-tailed Conure *Pyrrhura melanura*. However, the latter has red under wing coverts and carpal edge of wing.

The Fiery-shouldered Conure has a small range, being found in the region of the borders of Venezuela, Guyana and Brazil (extreme north-east Roraima). It occurs only in the isolated, flat-topped mountains, which are called tepuis, in forested areas. It lives in the tropical and sub-tropical zone, usually at altitudes between 700 m. and 1,800 m. The reason why this conure remained unknown in aviculture for so long is that this area is difficult to invade. According to Robert Ridgely, one of the most experienced ornithological field workers in the region, it is "seemingly quite common within its small range." Its population is believed to be stable.

The small captive population is probably increasing. I have been told of breeding successes in Switzerland and Germany. Certainly one of the two pairs in my care lost no time in the race to reproduce. They were still in quarantine when the first egg was laid! Each pair (previously surgically sexed) was housed in a small cage measuring 102 cm. (3ft. 4 in.) long, 51 cm. (20 in.) wide and 77 cm. (2 ft. 6 in.) high. The nest-boxes provided measured (internal dimensions) 30 cm. (12 in.) long, 17 cm. (7 in.) wide and 20 cm. (8 in.) high. Inside, a small wooden shelf was fitted under the entrance hole and 8 cm. (3 in.) above the floor; it was 10 cm. (4 in.) long. This prevents a bird entering the nest from dropping down on to the eggs, it gives a measure of privacy to females who prefer to incubate underneath and the young ones can sit on the board and look out before fledging. The nest can be inspected by means of the hinged flap at one end.

The birds had arrived on 1st April and one female laid her first egg on 28th April. There were two eggs by 1st May, three by 4th May, four by 6th May and the fifth was laid before 10th May. The date of the sixth egg was unknown because the female was incubating so tightly.

It was not possible to mark the eggs, thus I could not record the exact incubation period. What I believed was the third egg was opened by the parents and contained a chick which was full-term dead-in-shell. This was very disappointing but a short while later, on 1st June, there was a chick in the nest, followed the next day by

a second. If it was the fourth egg which hatched first, the incubation period would have been 26 days which would be a long period for a *Pyrrhura*. Probably it was the fifth egg, to give an incubation period of 23 days for the first egg, if the chick hatched the previous evening. In the climate of Gran Canaria, most *Pyrrhuras* hatch after 22 days with a day or two longer sometimes recorded for the first egg in the clutch.

The female was extremely protective of the small chicks, thus she was not disturbed for weights and descriptions to be recorded. Not until the eldest was 16 days old and had to be ringed (with a 5.5 mm. ring) were the chicks removed and photographed. At this age they are at their least attractive, with the second down starting to erupt in little white blobs on body and wings. Not much of the first down remains. Upper mandible and feet were pink.

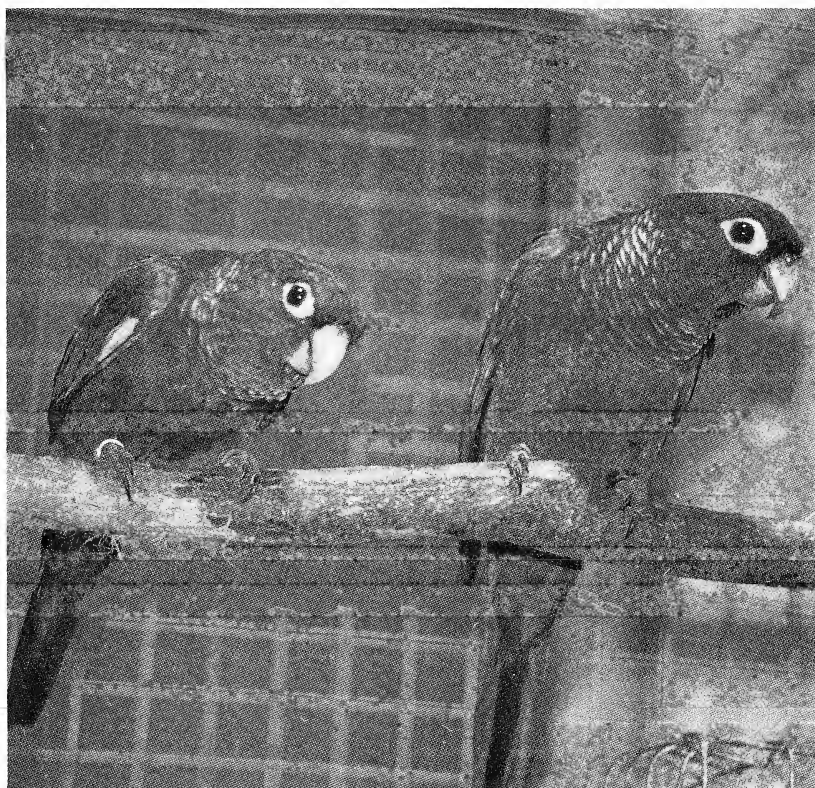
Three days later the orange feathers at the bend of the wing and two or three of the orange wing coverts were starting to erupt. The development of the youngest chick was several days behind that of the other. When the eldest was 22 days its flight and tail feathers were just breaking through the sheaths.

At 28 days both looked beautiful. The crown was dull green, the cheeks brighter green and the bend of the wing was quite brilliant orange. Scapulars and secondary coverts were bright green. The tail of the eldest was about one third the full length, the dark brown feathers being tipped with blackish. Much dense whitish-grey down was apparent, denser than in other *Pyrrhuras* with which I am familiar. The beak was still pinkish with brown at the base of the upper mandible. The beak pads were white.

The young were fully feathered a week later, both with an extensive area of yellow and orange at the bend of the wing. In *Parrots of the World*, Forshaw states that in immature birds the colour in that area is "much reduced" but this did not apply to these two. At 54 days the eldest differed from the parents only in the dark base of the upper mandible and in the light feet.

The eldest youngster left the nest during the last week in July. For several days before, the second stayed at the back of the nest-box, behind its sibling. I do not handle chicks just before they are due to leave the nest because of the likelihood of them leaving the nest prematurely. On 29th July, when it was 57 days old, it was apparent that the youngest was weak. It was removed from the nest for hand-feeding and medication but sadly it died the next day. The cause of death could not be established. The eldest youngster is now nine months old and indistinguishable from the adults.

Mention should be made of the diet of this species. It eats most seeds, fruits and vegetables offered. When the young were being reared, extra fruit and sunflower seed were consumed, also cuttlefish bone. I would suggest that fruit and vegetables should form at least 40% of the maintenance diet.



Pyrrhura egregia

Rosemary Low

It may be that no more wild-caught Fiery-shouldered Conures will be available. The few aviculturists currently fortunate enough to keep *egregia* must pair them with care, avoiding in-breeding, if the species is to have any future in aviculture. A stud-book, or a European alliance of breeders would increase the chances of its long-term survival.

Let us hope that its numbers will grow to the degree that all lovers of *Pyrrhuras* will eventually have a chance to keep it.

JEAN DELACOUR AND THE AVICULTURAL MAGAZINE

PART II(ii): 1920 - 1944

Josef Lindholm III

(Keeper II Birds, Fort Worth Zoological Park)

‘For nine years I had not been to see my friend Mr. G. H. Gurney's aviaries. I was delighted, when last August I arrived at Keswick to find that their number had more than doubled ... The aviaries are built in three groups: the oldest one is in a small garden surrounded by walls. There is a central path, on the right side of which is a long and large aviary inhabited by Black-necked Ibises, Cattle Egrets, Oystercatchers, Ruffs and Reeves ... Alpine Choughs, Crested Pigeons and Dominican Cardinals. On the left side one finds six smaller aviaries, all with heated shelters ... the first one is stocked with many small birds, mainly Finches and Weavers, one White-crowned Plover and a rare South American Whimbrel... the last one, very roomy, with three Tiger Bitterns.

* * *

‘... the second group of aviaries, also surrounded by walls, is newer and larger... These birds, in the day time, walk about the garden and paths between the aviaries: there are pairs of Dusky Trumpeters, Razor-billed Curassows, Pileated Guans, a Screamer, an American Wood Ibis and various Guinea Fowls...

‘On the left a very nice aviary... has been erected inside a greenhouse: there are males of the lovely Elliot's Pitta, Bellbird, Fairy Bluebirds, several Tanagers and Bulbuls. In cages, a few small Parrots, one very old Golden-fronted Bulbul, a Black-colored Barbet, and a very fine Crimson-breasted Shrike that Mr. Gurney has had for four years. It is to be noted that both Elliot's Pitta and the Shrike have kept very bright their green and red hues.

‘...there is a wide turfed path, on the left of which is a long flight inhabited by Manchurian Eared Pheasants, Budgerigars and a Cocoli Heron, which is quite harmless to small birds to my amazement!

‘On the other side, a row of nine fine new aviaries... contain many birds, among which I noticed Common Francolins... Kagus, Sclater's Crown-Pigeons on the nest... The central compartment, very roomy, is inhabited by Scarlet and White Ibises, Lesser Egrets and Gray's Pond Herons. In spite of the habits of its occupants, the

shrubs and grass are perfectly clean and nice, and I think this is a wonderful achievement.

‘At a short distance, in a field, stands the hawks aviary... There are seven cages, all 18 ft. deep, with different widths. One sees the following birds: one pair of American Bald Eagles, one Red-tailed Hawk and one Southern Chilean Sea-Eagle *Geranoaetus australis*, a *Busarellus nigricollis*, one pair of Montagu's Harriers, in fine condition, a pair of Kolb's Vulture and a Chimachima: one King Vulture: a Jackal Buzzard bred at Keswick seventeen years ago, and a Caracara...’

A visit to the Keswick Aviaries. October, 1930. (Series IV), Vol. IX, 259 - 261.

‘Among birds recently arrived at G ry, I should mention Black-crested Yellow Bulbuls, Racket-tailed Drongos, Crimson-crowned Whydahs, White-rumped Bicheno's Finches, Tambourine and Bartlett's Doves, Crimson-backed Waxbills, Brush Bronze-winged pigeons and Grayson's Doves, Motmot, etc... ’

M. A. Dexoux's Aviaries at G ry (HTE Vienne) October, 1931. (Series IV), Vol. IX, 286 - 288.

‘During the last year or more I have been so busy with different matters, and especially with the writing of the four big volumes on *The Birds of Indo-China*, that I have not sent to the Magazine my usual notes on my birds at Cl res since 1929.

‘And yet so many species new to aviculture have been imported during recent years and a few of these have come to me ...!’

* * *

‘My Pheasant collection is more or less complete. I have ... four species of *Polyplectron*: Palawan, Bronze-tailed, Germain's and Ghigi's Grey; a pair of the latter gave, this season, eight clutches of two eggs, rearing six young. We also reared to full size one Rheinart, for the first time in Europe... The hen, which had been kept out of doors the whole winter, started laying on 3rd may, again on 22nd May and 12th June... Incubation lasts twenty-five days. I had a pair of Bulwer's Pheasants, but the cock died suddenly and I do not like the look of the hen. I find that the Fireback group do not do well at Cl res and it is not worth while keeping them here, although I still possess pairs of the rare Bornean Crestless and of my own Fireback *Lophura delacouri*. But I now intend having them kept for me in the sunny south of France.

‘Since 1928 I have kept a pair of the rare Lewis's Pheasant *Gennaesus lewisi*, a very dark species of the silver group, discovered that same year on the mountains of Cambodia. In 1930 the hen laid

four unfertile eggs. In 1931 she laid five, three of which hatched and two young were reared... An imported pair of Mikado Pheasants produced thirteen young ones in 1930, and the same number again in 1931. This fine species from Formosa does not seem to breed before two years old. I have just obtained another pair from Formosa which will enable me to renew the blood.

'I also own some wild-caught, and therefore pure-blooded, Amherst Pheasants which I brought in 1930 from Yunnan. The wonderful Blue Crossoptilons sent to me in 1929 by Mr. Hampe being all males, hybrids with the brown species were reared last year and look almost like pure blue ones. One of these 1930 hybrid hens bred, in 1931, two young ones with a pure blue cock; these are indistinguishable from their father. In 1930 we reared some Soemmerring's Pheasants, a few of which escaped from their coop and have become established in the woods, where they are occasionally seen, together with some Bel's Kalij... During these two breeding seasons we also reared a fair number of... Brown Crossoptilon, Elliot's, Edwards', Imperial, Black-crested Kalij, Horsfield, Versicolor... Madagascar Guinea-fowl... Some Doves and Pigeons were bred: Diamond, Australian Crested, Bronze-winged, Jobi and Marquesa *rubescens*, and, for the first time since I have kept birds, one Nicobar Pigeon. To my surprise the young one remained nearly six weeks in the nest, till quite fully grown.

'The collection of Waterfowl is better than it ever was, although I must admit I have no more Pink-headed Ducks, Pigmy Geese, African Black Ducks, White-backed Ducks or Hottentot Teal... In 1931 a pair of South African Shelldrakes produced six young ones, and we reared one curious hybrid Rajah x Ruddy Shelldrake in size and shape: dark reddish brown, with white head and neck. Also we had a few Madagascar White-eyes and Meller's Ducks.

'Sea Ducks are doing very well on our clear running water. There are fifteen Eider and two Barrow's Golden-eyes, which feed greedily on grain and mash, with dried meat. One pair of Common Scoters have now lived for over three years and keep perfect condition, but they seem to thrive on natural food only, while a male Velvet Scoter, wounded at sea in August, has quite recovered and looks perfect; it has become fairly tame and feeds freely on grain and mash...

'I am sorry to say that the old *Sarus* which had been free-flying for more than ten years met with its death last summer, as it struck a high-tension electric cable, some distance from the park'.

Bird notes from Clères. January, 1932. (Series IV), Vol. X, 5-8.



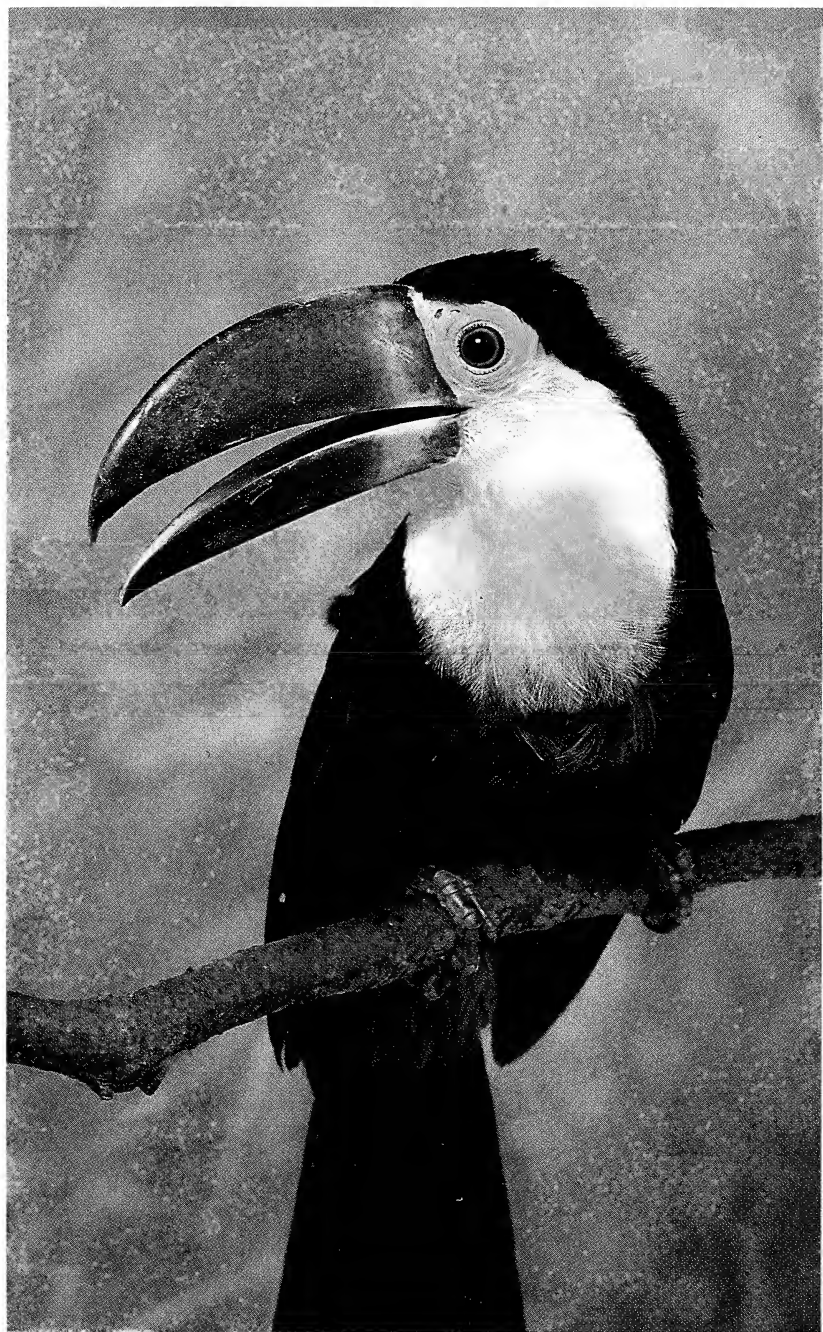
Denis Avon

Lilacine Amazon



Denis Avon

Yellow-throated Laughing Thrush



Denis Avon

Channel-billed Toucan



Denis Avon

Blue-eyed Cockatoo

'...In a large aviary, all planted with pine trees and heather, often changed, there are some Capercaillies, Hazel Grouse, Black Game and Siberian Jays, all tame and kept in perfect condition during the last three years. The very complete collection of Ostrich-like birds contains such rarities as Beccari's Cassowary, Spatz's Ostriches, Darwin's and Great-billed Rheas, the latter the form *R. americana* [sic], much darker than the common Grey Rhea.

'In the Bird House one sees some very rare Weavers and Whydahs, three Egyptian Plovers *Pluvianus*, Birds of Paradise, a tame Woodcock, many Humming-birds, several in perfect condition, a large Cotinga *Pyroderus scutatus*, but the real treasurers are two pairs of very pretty little Lorikeets *Psitteuteles iris* and Parrot Finches *Chlorura microrhyncha*'.

On a recent visit to the Berlin Zoo. January, 1933. (Series IV), Vol. XI, 21 - 22.

'Another interesting event was the first breeding in captivity of the Bronze-tailed Peacock Pheasant *Polyplectron chalcurum*. A pair of these quaint little birds, purchased two years ago as Mr. Frost brought them from Sumatra, started laying early in May. Unfortunately the first clutch was destroyed by the Rheinart's Argus living in the same aviary - which, by the way, is the largest compartment in my small birds' aviaries, 65 ft. by 22 ft., and where the crowds of Doves and small birds live beside the Rheinart's and Bronze-tails. However, instead of depositing her next two eggs on the ground, the little hen... chose for her nest one of the baskets hung under the roof for ... Pigeons and Doves ... The eggs were at once removed and placed under a Bantam. One was clear, but the other one hatched and the chick was reared to the adult stage...'

* * *

'My old Black-necked Crane, the only one ever imported into Europe, dies last summer. A great loss.'

* * *

'In the small birds' aviaries a certain number of more or less common species of Finches were bred, the most interesting being the Madagascar Weaver *Foudia*. I kept in the largest flight two pairs of birds that I brought over in 1929. One pair nested three times last summer in a privet, rearing four young ones. Of course, as it started breeding one of the males killed the other one...'

Bird notes from Clères for 1932. February, 1933. (Series IV), Vol. XI, 34 - 39.

'In the last two or three years, in fact since I have started keeping delicate small birds in a Tropical House, with heat and moisture

amongst a rich vegetation, a good many rare and little known species have come to me to be tried there, with good results as a rule.

‘... in my first Tropical House ... Rainbow and Indian Crested Buntings are very satisfactory; also Chinese Painted Quails which look lovely as they walk among the plants, Bartlett's and Marquesas Doves. With them live the old Fork-tail, tame and beautiful, a Blue-tailed Pitta, a White-capped Redstart, a pair of Niltavas, a Clarino, a pair of Fairy Bluebirds, at present nesting, a Rubythroat, some beautiful Manakins and Yellow-winged Sugar Birds, and a Senegal Sunbird. Peace reigns in the community and not a leaf is damaged by the birds. The next compartment houses only a breeding pair of tame Shamas and a fine Red-breasted Sunbird *C. gutturalis*, which there retains his brilliant scarlet at the moult, but is so spiteful as to kill any weaker bird.

‘The central part of the new house, which is connected with the old one by a glass-covered passage, contains a breeding pair of Purple Sugar-birds, a Vigor's Sunbird, finger-tame, a pair of Larger Minivets, one Lesser Minivet *P. cinnamomeus*, a pair of Tickel's, one White-browed and one Blue-throated Blue Flycatchers, a pair of Red-headed Tits *Aegithaliscus concinnus iredalei*, a Blue-headed Robin *Adelura coeruleucocephala* a Plumbeous Redstart, and a true pair of Hooded Pittas ... To them have been added a pair of Black and White Manakins *Manacus manacus* and some Humming-birds, such as *Eupetomena glaucis*, *Pygmornis*, *Thalurania*, *Lampornis* and *Hylocharis*.

‘In the side aviaries, which do not contain any vegetation but are surrounded by creepers and other tall plants, there are a Rifle Bird of Paradise and a very pretty Yellow-legged Ouzel *Turdus flavipipes* from Brazil, rare Barbets *Megalaema lagrandieri*, which I caught in Laos, and a Brazilian species *Capito aurovirens*; although of very different sizes they agree well, but will attack wickedly all other birds.

‘... another flight is given up to a large and varied population, Black-throated Cardinals *P. gularis* a very rare small species, Abyssinian Red-headed Barbets, Amethyst and Royal Starlings, a Cayenne Troupial, an Annamese Mesia *M. cunhaci* and some larger Tanagers; in others are a pair of Malacca Parrakeets, Red-headed *P. rubricapilla* and Beautiful Manakins *C. pareola*, and many sorts of smaller Tanagers. The special Humming-birds' compartment contains about fifteen Humming Birds of the following genera: *Phoelornis*, *Arytrria*, *Hylocharis*, *Chlorostilbon*, *Melanotrochilus*,

Eulampis and *Polytmus*'.

Notes on the small birds in the Tropical House at Clères. July, 1933. (Series IV), Vol. XI, 179 - 181.

'Although many species of *Pittas* have been introduced into Europe during the last twenty years... none had so far bred or even nested in captivity'.

* * *

'... it is almost impossible to keep two together, even in a large aviary and cock and hen of the same species, and this has been the principle obstacle to their breeding in confinement'.

* * *

'In the early spring of 1933, however, I succeeded in keeping together two Hooded *Pittas* *Pitta cucullata*. A species which is often imported from India ...'

* * *

'Both parents fed the chicks mostly on cut-up Bullock's heart, with meal-worms, a few earth-worms and insectile mixture... On 24th May one young one disappeared and was never found.

'...the growth of the youngsters was very quick. They came out more and more on the platform now, so much so that on the 31st one was out of the nest flying well enough. The weaker one also came out, but ... was drowned on 5th June, after having been flying well for several days. Both parents fed the remaining young bird devotedly, and did not abandon and bully it as I had feared, as the mother had started laying again in the old nest on the 31st, while the cock began another nest, further away ... the hen laid every day, as many as ten eggs, by 12th June. She insisted on laying in the old nest, and all but one egg dropped on the ground ... The cock had by then completed the new nest and would not go to the old one again. The birds were not sitting. On 13th June I removed the old nest and put eight eggs into the new one (I thought ten were too many). Very docile, the hen went to the new nest and incubation started immediately. Two eggs, probably addled, were rejected after a few days. At the same time, both parents continued feeding their first young, now quite strong, and eating also by himself since 12th June. However, on the 21st, I took him by hand (he is very tame) and removed him into another compartment, where he now lives happily.'

* * *

'On 23rd June the head of a chick was observed, and four the following day. At once a platform was built in front of the nest.

'On 11th July, on my return from the Ornithological Congress at

Oxford, the four young Pittas were out of the nest, and they all have been fully reared.

‘But we now come to the sad end of the story, and we shall see that, like the Thrushes, Pittas have the most wicked and puzzling temper.

‘As soon as the young ones had left the nest, the cock Pitta, whose plumage, and especially the quills, were in a very worn state, started at once building another nest ... [which] by 15th July ... was almost completed. I noticed that day there was a fight between the two parents, but I thought it was only, as usual, an introduction to their mating, and paid little attention to it. The next day the hen was chasing the cock, who kept hidden most of the time, and I decided to keep a special watch... I went into the greenhouse every hour or so, to see how matters were going on; it was very much the same. But at the end of the day the male was found dead in the pond!

‘... The hen has not laid up to now ... She carried on feeding the young ones and still is looking after them most devotedly to this day...’

Breeding the Hooded Pitta *Pitta cucullata*. September, 1934. (Series IV), Vol. XII, 222 - 226.

‘... each year three pairs of Demoiselles nest, always at the same places, very far distant, and rear their young without difficulty... catching insects all day long for their chicks. This year an old hen Eastern Sarus, who never had produced fertile eggs as long as she had a cock of her own species, hatched and reared two fine hybrids with an Australian Crane... One cannot say yet what they will look like...

‘Shelldrakes have been particularly successful; in the last two seasons over fifty Paradise, South African hybrid Rajah, Ruddy and Common Shelldrakes were bred. Ducks were bred in numbers, the rarest being Brazilian, Green-winged and Cinnamon Teal, Black-billed, Fulvous and true Red-billed *autumnalis* Tree Ducks, and Madagascar White-eyes.

‘...Among others, we have bred [over the last two years] ... Blyth's Tragopans (6), Rheinarte's Argus (4), Germain's Palawan (4), Bronze-tailed Polypelectrons, Blue Crossoptilons (25), Mikado, Copper, Edwards', Imperial and White-crested Pheasants. One hybrid Koklass (darwini x macrolopix) unfortunately died when three months old.

'One pair of Grey Polyplectrons has produced no fewer than eighteen young ones in two seasons. Roulrouls were hatched, but not reared...'

Bird-breeding at Clères. January, 1935 (Series IV), Vol. XIII, 24 - 25.

'In most parts of South America one sees along streams and ditches, and even in towns and gardens, some very pretty white, grey and black birds which remind one of our Wagtails...

'They are Water-Tyrants of the genus *Fluvicola*. Many years ago I saw many of the White-shouldered species, *Fluvicola pica* in Guiana and Venezuela, and I was very much struck with their attractive appearance. But I was told that they could not live in captivity. Fortunately M. C. Cordier, of Pernambuco, has found the way of keeping most Brazilian birds alive in his aviaries, and afterwards to send them to us.

'I got my first Water-Tyrants *F. climazura* more than two years ago. They arrived, it is true to say, in poor condition, and only two survived. Let out in one of my tropical houses, they soon settled down and enjoyed immensely the stones and water lilies of the pond. They proved tame and harmless to other birds. But they probably were of the same sex, as after over a year no attempt at breeding took place. They are purely insectivorous birds and take readily to the usual mixture, a little raw meat and a few meal-worms.

'Last summer I received two more specimens which, after they sufficiently recovered, were let out with the first two. Things did not go smoothly; fights took place and after some time two were killed. The two remaining birds were evidently a pair.

'Early last winter they started carrying moss and small twigs and soon built a purse-shaped nest, rather loosely made, in a creeper at a height of 8 feet overhanging the pond... but after about twelve days the nest was found to be empty and one broken egg, containing a well-developed chick, was found at some distance on the soil.

'Soon after another nest was built, in another creeper 2 yards away from the first one and higher up still. Eggs were laid again and, on 25th February, two young Tyrants left the nest... One chick was weak and died after three days, being found in the pond. The other one developed normally, and it is now indistinguishable from the parents. The young were reared quite easily on the parents' diet.

'A third clutch was laid in the same nest in May, and on the 26th three strong young ones came out. They are now in perfect health and although they have had a new brood the parents have never so

far molested their first baby. It is the more remarkable that they try to attack savagely a newly imported specimen in a neighbouring aviary.

‘As Mr. de Quincy tells me, these Water Tyrants are quite hardy, and his pair wintered safely out of doors this year. They also bred but the young died soon after they came out of the nest. There is no doubt that tropical birds have a much better chance to rear their offspring when always kept at a favourable and even temperature, as is the case in my greenhouses.

‘Three years ago a pair of Shamas reared two full broods without losses in one of the compartments; and one knows that, although they nest freely, the young are not too easy to breed in an outdoor aviary. Also it may interest our readers to hear that my Hooded Pittas have young again. The breeding pair is composed of the old hen and one of her sons bred last year...’

Breeding of Courier Water-Tyrant *Fluvicola climazura climazura*. July 1935. (Series IV), Vol. XIII, 171 - 173.

‘Like every other year, 1935 has had its good and bad points....

‘In the outdoor aviaries, we had a number of young of the Forest Foudij [sic] *Foudia omissa*, the rarer of the two red Madagascar Weavers. Also, for almost the first time in the fifteen years that they have lived in their aviary. Pekin Robins reared a brood of four, and perhaps more, as nests were overlooked, and they seem to be now so numerous than before.

‘Some Whydahs and Weavers also nested, but I do not know quite which species actually succeeded.’

* * *

‘My pair of Lidth's Jays gave us hope at a certain time, but they did not go any further than carrying sticks. They are very tame and amusing, and I think the most beautiful members of the Crow family in spite of their rather dark hues.

‘A few pairs of the pretty Fischer's Whydahs were brought to me from Abyssinia last spring, the males in full colour and perfect condition. They have done very well out of doors. At the end of November, the cocks still are in full colour. I keep these Whydahs, as well as Queen, Pintail, Steel and Paradise, in large aviaries inhabited by various Waxbills, Zebras and Grassfinches in case Whydahs may some day lay in their nests...

‘Among the new inmates of my outdoor aviaries, I should like to mention some Pink-crested Touracous, Wood-hoopoes, Amethyst Starlings (which are much hardier than supposed, and do badly indoors), some very pretty Red-headed insectivorous Weav-

ers *Anaplectes melanotis*, and, thanks to Mr. Sydney Porter's generosity, some lovely Mountain Witch Doves. Five Madagascar Partridges were reared by the parents'.

* * *

'Waterfowl were quite satisfactory in 1935. Some 400 were reared which is not a bad result when one realises that there are between 2,000 and 3,000 birds here of about 600 species, belonging to the most varied groups. And all need looking after carefully!'

* * *

'For the first time in captivity, the New Zealand Shoveler ... was bred. Mr. Sydney Porter brought home one male and two females last year and kindly lent them to me in the spring. They were full-winged and were put into a duck aviary ... where Cotton Teal, Spotted Tree-ducks (... imported for the first time from New Guinea), and a few small waders are also kept'.

Breeding and other notes from Clères. January, 1936. (Series V), Vol. I, 2 - 6.

'M. E. Plocq, a well-known and very clever amateur ... bred Swallows in his aviaries at Roc Roche-sur-Yon (Venée) last summer. M. Plocq, for more than twenty years, has been rearing Swallows, taming them so that he can let them fly out at complete liberty and they come back and settle on his hands whenever he whistles. He usually lets them ... migrate south in the autumn. For the last three years, however, he kept one male as well as a female Rock Martin throughout the winter... He also kept in the same way a hen Swallow during the winter 1934 - 5. In the following spring the pair of Swallows built a nest... against the wall of an aviary 25 feet by 12 feet by 6 feet... Five young were hatched, the first two died because their birth was not noticed and no proper food was supplied; the next three were very easily reared by the parents on ants' eggs'.

Swallows breeding in captivity. May 1936. (Series V), Vol. I, 140 - 141.

'On 14th November I left Chicago at 6.30 am by air, and before 7.30 pm I was at the Sacramento Aerodrome, a journey which takes over three days by train. Mr. L. Leland Smith was waiting for me, and took me to his home at Fair Oaks...

'Mr. Smith owns the finest collection of Pheasants in America... the gems of which are several pairs of the White Eared Pheasant and a pair of Chinese Monaula. He also possesses and breeds Koklass, Rheinartes, Argus, Palawan and Bronze-tailed Polyplectron; and I saw there a pair of the rare *Tetroaphasis thibetanus*, a large

Partridge from the high mountains of Western China'.

* * *

'For an Old World aviculturist, one collection is of very great interest, that of Mr. Eric Kinsey, at Manor, in a cool and shady canyon of Marin County, north of the Bay of San Francisco. Mr. Kinsey, the president of the Cooper Club, is an excellent ornithologist, who knows as much of wild Californian birds as anyone on earth. But, quite rightly, he believes that there is a great deal more to be learned of the habits and behaviour of birds by keeping them in captivity... Mr. Kinsey has specialised on Californian Passerine birds, and keeps no others, except a few Anna and Allen's Humming-birds. Of course, he can only do so by enjoying a special scientific permit from the Federal Government and the State of California... I spent several days up country with Mr. Kinsey to trap some of the birds that I was kindly allowed to take home with me, and I had a very interesting experience, watching and catching such lovely species as Western and Mountain Bluebirds'.

* * *

'As our members know well, it was Lord Tavistock's enterprise that started Parrakeet breeding in California. The birds he sent several years ago have produced many of the present inhabitants of the Los Angeles aviaries. All aviculturists ought to be grateful to him for such a happy initiative.'

* * *

'The largest private collection of birds in the district of Los Angeles is perhaps that of Mr. W. J. Sheffler, a vice-president of the Avicultural Society... At his home has... one of the most varied mixed collections of birds that I have seen in the district... Large box cages are the home of some Tahitian blue Lories, which nested last summer, but unfortunately resented inquisition and forsook their eggs.

'Some miles away, but still in Los Angeles City... Mr. Sheffler has built a large block of aviaries... In the numerous compartments live many different species of Parrakeets; Mealy Rosellas and Pennant's breed very freely, as well as different Cockatoos and Conures. I noticed especially several Brown's, a pair of Norfolk Island's, Lucon Tanygnathus, Mitchell's and Forsten's Lorikeets, and hybrids with Swainsons's. There are also quite a number of Jay Thrushes, Mexican Jays, etc., and a fine pair of Harris Hawks *Parabuteo unicinctus*.'

* * *

'Mr. and Mrs. B. Black have very large, wild aviaries ... For over

ten years they have bred the fine *Otidiphaps nobilis* [**Pheasant Pigeon**], and they still have eight of them. I noticed a gorgeous hybrid between Borneo Fireback x Swinhoe Pheasant. Mr. Black claims that they reared a hybrid between the Nicobar Pigeon and the *Otidiphaps*, which unfortunately, I could not see'.

* * *

'Mr. Gilbert Lee has been successful in breeding Grey Parrots and Eclectus for several years, and he has quite a breeding stock of them... The gems of his collection are a newly arrived and exquisite pair of Marquesan Blue Lories... and a pair of Kuhl's Ruby Lories... These have been nesting repeatedly for several years, but only one young was so far reared, all the others dying after a couple of days. Mr. Lee is now trying a new and more insectile diet, which they probably require.

'Dr. Leon Patrick, at Orange, is one of the first and most successful Parrot breeders in California, and many of Lord Tavistock's birds have been entrusted to him. He has a choice collection, including several pairs of Norfolk Island, Pileated and Derbyan Parrakeets. He has just bred a hybrid Panama x Levallant's Amazon.

'In the vicinity of San Diego... we visited what is perhaps the largest private collection of Parrots in America, that of Mr. I. D. Putnam. He has some 150 large outdoor compartments... Mr. Putnam owns many pairs of different species of Australian Parrakeets, including Brown's and Pileated, of Conures, Lories, Macaws, and a few others. There is a beautiful tame Masked Parrakeet from Fiji... and also a few Game birds, among them some Masked Bobwhites *Colinus ridgwaysi*, from Texas, a rare species.'

* * *

'Mr. and Mrs. Keith Spalding own a unique collection on their large estate of "Rancho Sespe"... A very bright Red Shining Parrakeet from Fiji, attracted my attention, among many other rarities... higher upon the slope of the hill, there is... a Game Farm, with numerous roomy pens; many pheasants and innumerable Peafowl live and breed there, as well as what made "Rancho Sespe" famous in the avicultural world - a breeding pair of Ceram Cassowaries and their offspring... The male and the female live in adjoining pens, but separately; they can only be safely put together... for a few hours at a time... In 1934 two were bred and they look now almost like adults. Last year the hen killed the chicks through the wire partition, so that now the male and his brood are removed father away. This year there is another fine chick...'

American Aviculture. May, 1937. (Series V), Vol.II, 125 - 139.

'In the early months of 1932 my friend, M. R. Homberg, sent me two male Velvet Scoters *Oedemia fusca* from the sea shore near the Somme estuary. He had been endeavouring for some time to procure for me some of these interesting birds alive, by shooting them slightly in the neck, at long range, with very small shot. Both birds arrived in fairly good condition, but of course with rather stiff necks. One survived only a few months, while the other one gradually improved, and eventually recovered completely. Let out on the lake, the bird soon became very tame and greedy...

'... the Velvet Scoter looked perfect, till about a year ago, when he began to show signs of old age; the nail of its bill grew too long, and we had to cut it; its general appearance became gradually that of an aged bird. It died early this year.

'I have never yet seen another Velvet Scoter in confinement, nor heard of any being kept in captivity for more than a few weeks...

'A beautiful male Long-tailed Duck, caught and sent to me by M. Homberg at the same time, and by the same method, is still in perfect condition...'

The Velvet Scoter in captivity. May, 1938. (Series V), Vol.III, 129 - 130.

'Luck seemed to be against us in 1938; the impossibly cold and dry spring, and more still the serious illness of Mr. F. Fooks during April and May, were a serious handicap to successful breeding. And to add to it, I had to make preparations for the International ornithological Congress which took place at Rouen in May, so that I personally had very little time to spend with the birds at Clères.

'... However, quite a few [birds] were reared this last season...

'A pair of Manchurian Cranes reared a fine female, hatched in April. They live in a 50 acre enclosure, where natural food is plentiful, in company with Darwin's Rheas, Pseudaxis Deer, and a few waterfowl...'

* * *

'My old Harlequin drake literally committed suicide by following Mandarin females on foot hundreds of yards from the water, up in the park, as they were looking for nesting holes. When I discovered it, it was almost too late, and he died of exhaustion, never taking time to feed properly. His mate had died the summer before after five years on the lake'.

* * *

'... the Courier's Water Tyrants ... reared two broods as usual in the greenhouse'.

Breeding results at Clères. January, 1939. (Series V), Vol. IV, 2-4.

'M. Cordier accompanied me to Indo-China last autumn. While I was collecting skins in North West Laos... he went to Chapa, a hill-station in Tonkin, close to the Yunnan border. In 1929 - 1930 we had made there a remarkable collection of skins, obtaining over fifty new forms...

'Mr. Cordier arrived on 12th May, with about 300 birds, many of which are new to aviculture, and extremely attractive. The greatest part of them are now at Clères and at Foxwarren. As they inhabit quite a cold country, where frost and snow are not uncommon in winter, they should prove very hardy. Perhaps a few words on the more interesting species may prove of some interest...

* * *

'LONG-TAILED BROADBILL *Psarisomus dalhousiae* - a marvellous bird ... A common forest bird in damp country, purely insectivorous and difficult to keep, which has never been brought alive before.

'FULVOUS PITTA *Pitta oatesi* - a large high-ground Pitta, of a beautiful pinkish chestnut, with green upperparts. First arrival.

'ELLIOT'S PITTA *Pitta ellioti* - one of the handsomest of all Pittas; my pair, imported three years ago, build and nest every year, but destroy their eggs. The nest is dome-shaped, but wide open in front.

'BLUE-WINGED LAUGHING THRUSH *Garrulax squamatus*...
FOOK'S LAUGHING THRUSH *Garrulax subnicolor fooksi* - bronzy brown bird, wing feathers lined with yellow. GOLDEN-WINGED LAUGHING THRUSH *Garrulax connectens* ... RED-TAILED LAUGHING THRUSH *Garrulax milnei indochinensis* - crimson wings and tail, grey body, reddish cap, and white cheeks.

'These four Laughing Thrushes are very beautiful and remind one of a large Pekin Robin in their ways. The three first are new to aviculture, and of *G. milnei*, only one was brought home by myself in 1929; it is still alive'.

* * *

'In October, 1938, M. Cordier had brought for me from Guatemala twelve Ocellated Turkeys. With the exception of one adult pair, all had been brought up by him from the egg. Now six of these very rare and difficult birds are well acclimatised and live at Clères, and four at Leckford'.

'At the same time he brought over some rare small birds, of which I shall mention some lovely Humming-birds: *Lamprolaima ramhi*, *Eugenes fulvens*, *Saucerottea devillei*, *S. feliciae*, *Chrysuronia aenone*, *Chlorostilbon alicrae*, *Colibri iolata*; and

some Tanagers: *Ramphocelus icteronotus*, *R. passerini*, *R. sanguinolentus*, *Thraupis abbas* and *Chlorophonia occipitalis*'.

* * *

'Since writing the above notes, a young Elliot's Pitta has been reared, and a pair of Shamas, which arrived at Clères on 10th May, bred three young in the nest on 20th June in one of my Tropical houses'.

M. C. Cordier's collection. August, 1930. (Series V), Vol. IV, 267 - 271.

'All our gardeners and four bird-keepers have joined up since the beginning of the war; another one is soon going. But Mr. Fooks is fortunately staying at Clères, and is able to carry on with a reduced staff. By the doubtful privilege of age, I am remaining in the district, though on military duty, so that I can see my birds at frequent intervals.

'For the moment we have decided to keep the whole of the collection, only thinning out gradually to a couple of pairs the more ordinary species of Pheasants, waterfowl, and small birds, or even suppressing the very common ones altogether'.

* * *

'Cranes laid very well, but we were unlucky in several ways... The White Asiatics laid one unfertile egg, the first one since eighteen years they have been at Clères. The Eastern Sarus paired up to an Australian, which had reared many young in the past, laid late, and did not hatch. One Manchurian was reared...

'... Rare Geese were raised: 1 Red-breasted, 5 lesser White-fronts, 3 Greater Snows, 4 Blue Snows, 5 Ross's, 4 Emperors, 2 Cereopsis, 4 Ruddy-headed, 2 Ashy-headed, 6 Blue-winged, 4 Andean, 5 Maned (hatched late in August), as well as many Paradise, South African, Common and 3-4 Radjah Ruddy Sheld-ducks [sic], and 3 Australian Sheld-ducks, the latter for the first time in captivity, and also seven Comb Ducks, hatched in September. It is the first instance of their breeding at Clères. The seven eggs were laid in the same nest as eight Maned Goose's eggs, in a hut up in the park... Twenty wild Muscovies were reared from one pair...

'Many Ducks were reared from eggs collected round the lake and ponds: ... Chinese Spot-bills, Yellowbills, Meller's, American Blacks, Chiloe Wigeons, Shovelers... Red-heads, White-eyes Madagascar White-eyes, Lesser Scaup and Common Pochards; three Common Golden-eyes could not be raised, as well as one Ringed Teal. New Zealand Shovelers laid unfertile eggs.

‘Several Ducks were reared on the lake by their parents, including Red Shovelers, Versicolor and Cinnamon Teal, Greater Scaup, and a few commoner species.

‘Among game birds, 23 Tragopans of four species, 12 Blue Crosoptilions, 20 Mikado, 7 Elliot's, 9 Soemmering's, 6 Bel's, 3 Lineated, 1 Horsefield's, 3 White-crested, 6 Edwards' Pheasants, 10 Sonnerat's and many Red Jungle Fowls’.

* * *

‘In the greenhouses, an Elliot's Pitta and seven Indo-Chinese Shamas (two broods) were successfully bred. White-capped Red-starts nested several times without result, proving extremely spiteful during the season. A pair of Garnet-throated Humming Birds built a lovely nest in an hibiscus tree, but did not go any further.

‘Now, all the birds have been removed from greenhouses to bird-rooms, as it would have been very difficult to obtain coal to heat them during the winter. The rarer plants have been deposited at the Rouen Botanical Gardens, and I hope to be able to replant the houses when the war is over. It was very heart-breaking to me to close these houses, which were so attractive in every way; this is the only noticeable difference that the war has made to Clères so far...’

The birds at Clères in 1939. November, 1939. (Series V), Vol. IV, 347 - 350.

‘I suggest that any member or breeder who owns some of the better Pheasants and for some reason has to part with them, gets in touch with either the O.P.S. or the Avicultural Society, so that his precious birds can be saved by others more fortunate, who can endeavour to see them safely throughout the present war’.

The preservation in captivity of Chinese Pheasants. November, 1939. (Series V), Vol. V, 1 - 2.

‘Clères, as a bird park, is no more...

‘When last I saw it, on 7th June, 1940, some thirty bombs, dropped a fortnight before, already had marred its appearance in many places and several hundred birds and mammals had been killed. I was then ordered away with my army unit and I have not seen Clères since.

‘But I know that on the day I left, as well as on those immediately after, the park suffered greatly from further bombings, as well as machine-gunning from the air. Four people, as well as many more birds and animals, were killed.

‘Then came the German troops. There followed looting and the loss of still more birds and animals. Some of these escaped through doors left open, while others mixed with different species and were

killed in the ensuing fighting. However, the Germans permitted three of my men, who had remained near by, to return and care for what was left... But naturally in the interim all the more delicate species, including the Birds of Paradise, the Humming Birds, Sunbirds and those of insectivorous habit, had died of starvation.

‘Mr. F. Fooks, who for twenty years had taken care of my collection and managed my estate with the utmost zeal and devotion ... had wanted to stay on at any price and against my advice. But on 8th June, having moved some of the rarer birds to a place of supposed safety further west, he found he could not re-cross the Seine and so was cut off from Clères.

... Some days later we met by luck at the home of an old friend and bird lover, M. A. Decoux, near Limoges in Central France, whose fine collection of Parrakeets, Doves and small birds, I am glad to say, is still intact and so far unmolested.

‘Here Mr. Fooks and I parted. As I watched him, his French wife and his children depart in a car driven by one of my sergeants, I realised that the last connecting link between me and what had been my life for many years had been severed. The Fooks family eventually arrived safely in England after a perilous journey, while I went to Agen, in South-western France. Here I was demobilised on 20th July. My small part in the defence of France was finished’.

* * *

‘After spending four months following my demobilisation in an idleness which was painful, despite the companionship of my mother. I was lucky enough to be allowed to go on to New York, where the hearty welcome of my American friends gave me a new taste for life. I was soon offered the position of Consultant to the New York Zoological Society. Needless to say I accepted and the great interest I am taking in the work, as well as in some other of a scientific nature at the American Museum, no doubt will gradually lessen my bitterness over everything I have lost in Europe’.

* * *

‘Aside from such memories as the writing of papers may revive, or which may result from other causes from time to time, for me the past is dead. Perhaps my bitter experience may serve as an object lesson to those who hold material possessions in too great esteem and to remind others that nothing in this life should be regarded as permanent.’

The end of Clères. May - June, 1941. (Series V), Vol. VI 81-84.

Captain Delacour's years in New York have been discussed in some detail in a previous number of this magazine (Lindholm, 1988).

'I have spent an early June weekend in the country with my friends, Mr. and Mrs. Milton Erlanger, and for the first time in many months I have had the time, and everlasting pleasure, to watch aviary birds. This may sound strange, as my present position of Technical Adviser to the New York Zoological Park gives me the control of the mammals, birds and reptiles, and our collection of birds is the best now existing, numbering 1,800 specimens of 700 species, about half of which are perching birds. But my duties are many and absorbing, with planning, committee meetings, and office work, and I have little time to do more than quickly examine the birds in our zoo. Mr. Lee Crandall, the Curator, and Head Keeper George Scott, themselves overworked, are both excellent aviculturists, and I rely on them to take care of our birds. Although we almost entirely lack suitable outdoor accommodation, so necessary to many species, the condition of our collection is excellent, the longevity of our birds being quite remarkable, with losses at a minimum. But, as I have just said, our outdoor flights are almost non-existing, a deplorable state of affairs which would already have been remedied if the war had not brought in additional difficulties...'

A collection of small birds in New Jersey. July - August, 1942. (Series V), Vol. VII, 117 - 119.

'For more than ten years it has always been a thrilling experience to see Mr. C. Cordier arrive with a collection of birds. It happens once or twice a year. Until 1939 he used to bring his collection to Clères, and the surplus material found its way mostly to the London Zoo, to Mr. A. Ezra and Mr. Spedan Lewis in England, and to Dr. E. Beraint and M. Francois Edmond-Blanc in France. Those happy days are over, alas! But Mr. Cordier still brings his collections, now to the United States. He brought us, to the New York Zoological Park, a marvellous Colombian collection in December, 1941, and early in October 1942, he was back again, this time from Costa Rica, with perhaps the finest lot of birds he has ever secured.

'There are ninety-six birds in the collection, including three Umbrella Birds which have never before been exhibited alive. Fifty-four Humming Birds of which the majority have never been imported anywhere, and eighteen Quetzels'.

'In the new home of the Humming Birds that is being rushed in the Bronx Zoo's Bird House, they will be exhibited behind glass in small brightly lighted cages, while the public will view them from a black passageway'.

* * *

'We had to dispose of some of the Quetzals, keeping ten for our collection. For the first time, I saw perfect specimens... tame and feeding well. Six inhabit a large planted aviary, and although there are several adult males, they never quarrel; neither do they molest the small birds, mostly Sugarbirds and Tanagers, which share their flight. The Umbrella Birds are also extremely tame and harmless.

'We are now completing the transformation of our halls, where pigeons and Parrots used to be kept in rather old-fashioned and ugly cages. We are making five long planted flights of different styles, more or less in the same way as the greenhouse aviaries at Clères were planned. One has a fast-running stream and is called the "Tropical American mountain stream". It contains some Blue-headed and Ruddy Buntings, a small South American Barbet, a dozen Manakins and Sugarbirds, a few small Tanagers, and a pair of Fire-throated Humming Birds Panterpe. The next one is an "Indian-Malayan jungle"; there live some small Fruit Pigeons, Green-wings and Bleeding Heart Doves, a Pitta, a Rothschild's Starling, a Shama, a small Javan Barbet, some bulbuls and Babblers, a few Timor Paddas and Crested Buntings.

'The other three, which will soon be completed, will be a "desert!", an "American Garden"; and a "Tropical American Rain forest". It is great fun designing and planting these aviaries. I find it the best substitute to the pleasure I so long used to have at Clères on a larger scale'.

A collection of birds from Costa Rica. March - April, 1943. (Series V), Vol. VIII, 29 - 32.

'At the present time Mr. Fooks has taken charge of the estate and collection of Capt. the Hon. Henry Broughton at Englefield Green. Captain Broughton, now in the army, possessed at the beginning of the war, a large collection of perching birds ranging from Humming Birds and Sun-birds to Birds of Paradise, Kingfishers and Parakeets, with many extremely rare species among them. The feeding of such delicate birds under the present food restrictions in England is a difficult problem, in fact most of such birds at the London Zoo did not survive the privations of 1940. But Mr. Fooks managed to keep those in his care in excellent condition, even rearing broods of the rare Rothschild's Grackle in 1941 and 1943 and having

Touracos and Woodpeckers nest. On the diet of his birds he writes as follows:-

"The composition of our substitute for fruit is simple - boiled potatoes and boiled carrot, 2 lb of the former to 1 lb of the latter, passed through a mincer then well mixed together and dried-off with chicken or dog-biscuit meal. If properly done there should be nothing sticky or wet about this mixture, but should be fairly dry and crumbly.

"The Insectivorous mixture is made up daily as follows: Scalded granulated dog or chicken biscuit, to which is added 10 per cent of meat meal and a little finely grated carrot.

"Touracos, Cocks of the Rock, Manakins, etc., are given the fruit substitute with a little of the Insect food hitherto called No. 1 and No. 2 with a little raw minced horse flesh added ... Small Kingfishers *Halcyon*, minced horse flesh (heart), gentils and mealworms. Laughing Kingfishers and Frogmouth, mice and raw horseflesh. Note: All meat for insectivorous birds, including Cissas, Rollers, etc., is well mixed with biscuit meal and that given to small Kingfishers just sprinkled with it".

* * *

'It is quite remarkable to hear of such an achievement. Of course, much depends upon the way in which these substitute foods are mixed and it is all important that the mixture be always dry enough and crumbly'.

Substitute diets for insectivorous and frugivorous birds. March - April, 1943. (Series V), Vol. VIII, 50 - 52.

'Having recently been appointed a collaborator of the [United States Fish and Wildlife] Service, and acting as an advisor, I have inspected in May, 1944, the present haunts of the Trumpeter Swans, and possible locations where the birds could be established.

'The following extracts of my report will give an idea of our present project to propagate and save the species:- ...'

The fate of the Trumpeter Swan. November - December, 1944. (Series V), Vol. IX, 127 - 132.

The detailed report from the field was reproduced in its entirety (Dolton 1988) in Volume 94 of this magazine.

'...After more than four years, I somehow still cannot realise that it is all a thing of the past. I shall never cease to regret the loss of such an accumulation of feathered treasures.

'However, let it be but a happy memory. To-day I have come

back to where I stood when I was five years old. I personally own two birds: a Roller Canary in my bedroom, and a very good Shama, a present of a kind friend, Mrs. E. Erlanger, which enlivens my charming office at the Bronx Park. As I write, he sings delightfully...'

Avicultural Entente Cordiale. November, 1944 (Jubilee Supplement Series V), Vol. IX, 5 - 10.

ACKNOWLEDGEMENTS

I am most grateful for the assistance of Steven Johnson, Librarian of the International Conservation Society.

I wish to acknowledge the foresight of Lawrence Curtis, who while Director of the Fort Worth Zoological Park, in the early 1960s, arranged for the purchase of a partial set of the *Avicultural Magazine*, complete for the '30s and '40s.

REFERENCES

- DOLTON, K. (1988). Dr. Delacour and the Trumpeter Swan rescue programme. *Avicultural Magazine* XCIV, 59 - 64.
- GIBBARD, A. (1988). Jean Delacour's contributions to the *Avicultural Magazine*, 1916 - 1982. *Ibid.* XCIV, 70 - 81.
- LINDHOLM, J. H. (1988). Captain Delacour at the Bronx (1941 - 1947). *Ibid.* XCIV, 31 - 56.
- SETH-SMITH, D. & POCKOCK, R. I. (1923). Editorial. *Ibid.* (Series IV) I,1 - 2.

* * *

BREEDING THE YELLOW-NAPED AMAZON

By K. W. Dolton (Worcester)

The Yellow-naped Amazon *Amazona ochrocephala auropalliata* is a large and handsome bird, which is easily identified by the area of yellow on the nape of the neck. It has a range which extends from southern Mexico southwards to north-west Costa Rica. The subspecies is imported into the United States in large numbers as it rivals the African Grey for its 'talking' abilities.

I purchased my first Yellow-naped Amazon from a pet shop in the late 1970s and the bird did indeed prove to be a marvellous talker. As far as I know, there was only one other example in the UK at the time and that was in Yorkshire. Unfortunately mine died from pseudotuberculosis in 1989.

Quite a few birds of this particular subspecies were imported in 1987 and in the autumn of that year I managed to make up two pairs from immature, but surgically sexed, examples.

In 1992 one of the pairs nested in a box measuring 24ins high x 10ins x 10ins. They laid two fertile eggs which were removed in order that a friend could put them into an incubator and hand-rear the resulting chicks. They proved to be male and female when sexed last year.

In 1993 the same pair laid three eggs which I left for them to incubate; all three hatched and the young were reared without any assistance from me. The diet was soaked sunflower, peanuts, pine nuts, carrot, apple and brown bread and milk.

All three young left the nest box when 12 weeks old on 18th July and were independent by 20th August.

These youngsters were as large as the two which had previously been hand-reared and late last year yellow feathers were already appearing on parts of the head and neck. The hand-reared birds - although 12 months older - were still not showing this colour.

I understand from David Spilsbury, who saw these birds with their parents, that this could be a first breeding.

* * *

This is probably the first successful breeding of the Yellow-naped Amazon in this country. Anyone who knows of a previous breeding in the U.K. is asked to inform the Hon. Secretary.

* * *

SOCIAL GATHERING

Members of the Avicultural Society gathered at the home of Dulcie and Freddie Cooke on 8th May.

Guests were welcomed with lunch served in a pretty marquee which had been organised by the Cookes especially for this occasion. Aviculturists chatted and exchanged news, good and bad, over a buffet lunch of cold meats and salads with wine, followed by superb fruit cheesecakes all made by Dulcie.



Suitably enlivened, guests wandered out into the garden, over an immaculate lawn. The long border was a blaze of colour with all the azaleas in bloom, while the flights were flanked by tulips, forget-me-nots and blossoming espaliered apple trees. What was evident was not only the immensely hard work put into the garden by Freddie, but also the careful planning and eye for colour and design which produced such a ravishing effect.

As always at the Cookes, the birds look in superb condition. Dulcie and Freddie have bred lories very successfully for many years, and there is no doubt that the care and detailed work which goes into the feeding and management of their collection is clearly visible in the presentation and behaviour of their birds. Not only are the parrots confident and friendly with visitors, but it is clear that they are used to, and enjoy, the attention.

The Avicultural Society would like to thank Dulcie and Freddie for all the support they give to it, and for the hard work and care that makes this annual visit to their home such a memorable pleasure. All the proceeds from ticket sales were donated to the Avicultural Society.

Rosemary Wiseman

BOOK REVIEW

Practically everything that needs to be written about the *HANDBOOK OF THE BIRDS OF THE WORLD* has already appeared in reviews published in most of the world's most eminent ornithological and biological publications. It is an unusual, possibly unique, situation when a work received - as has the HBW - such universal acclaim. Soon after its publication in 1992, the first volume was awarded the title of Best Bird Book of the year by *Birdwatch* magazine, an accolade endorsed by *British Birds* the following year. If the remaining 11 volumes are of the same high quality as the first, we can look forward to a work of unparalleled importance and value.

Volume 1 weighs 3.5 k and has 696 310 x 240mm pages. It contains 50 excellent colour plates of birds, 382 colour photographs, 568 distribution maps and more than 6,000 bibliographical references. This volume covers Ostrich; Rheas; Cassowaries; Emu; Kiwis; Tinamous; Penguins; Divers; Grebes; Albatrosses; Petrels and Shearwaters; Storm-Petrels; Diving-Petrels; Tropicbirds; Pelicans; Gannets and Boobies; Cormorants; Darters; Frigatebirds; Herons, Hammerkop; Storks; Shoebill; Ibises and Spoonbills; Flamingos; Screamers; Ducks, Geese and Swans.

An introductory chapter to Volume 1 by Dr. Eduardo de Juana (of the International Council for Bird Preservation), provides a thorough and authoritative account of the world of birds, dealing with such diverse aspects as evolutionary history, anatomy, physiology, migration, systematics, etc.

Throughout the book the basic unit is the family, with complete and comprehensive chapters devoted to each one. All such chapters start with a summary box which provides brief and basic elementary details of the family being discussed. The text which follows is both comprehensive and comprehensible under such headings as Systematics, Morphological Aspects, Habitat, General Habits, Voice, Food and Feeding, Breeding, Movements, Relationship With Man, and Status and Conservation.

Taken at random from the 27 families dealt with in Volume 1, 14 pages are devoted to the Tinamous before the reader moves on to concise but informative species accounts, accompanied by colour plates depicting all species.

General text dealing with each family is up-to-date and rigorously scientific, whilst not detracting from the volume's essential

'readability'. Subdivisions of the most complex families are illustrated by means of clear diagrams. Each order starts with a summary page, listing some of the distinctive features; lower subdivision (suborder, family, subfamily, tribe, genus, species subspecies) appear in the Handbook in the appropriate position, so that the work also constitutes an annotated checklist of the world's birds.

Illustrations are an outstanding feature, with colour plates which will ultimately cover all the living species, together with distinctive subspecies, and which are normally followed by three pages of detailed species accounts in condensed form.

Nearly 400 magnificent colour photographs, including a number not previously published, are another major plus-point. Nowadays plenty of ornithological and avicultural books have photographic illustrations which are technically of the highest quality. But most are simply excellent portraits. The *HANDBOOK OF THE BIRDS OF THE WORLD* has many photographs which illustrate complicated behaviour patterns including courtship, thermoregulation or feeding techniques. As the publishers point out, '... they are not simply portraits, as the 50 colour plates show the necessary details of plumage and morphology'.

Photographs of rare and little-known species have, wherever possible, been selected ahead of those of more commonly seen ones.

I have yet to come across a review of this outstanding first volume which is critical of its text, illustrative content, manner of presentation or production quality. It marks, one hopes, the start of what will surely be the definitive work covering *all* of the world's bird species for many years to come. It will soon be joined by Volume 2 which covers many more families of interest to aviculturists ranging from new World Vultures to Guinea-fowl. There has been a gap of almost two years between the appearance of these two volumes, but the publishers hope to increase the frequency to one volume per year so that the 12 volume set should be complete within a decade. It will be well worth waiting for. *THE HANDBOOK OF THE BIRDS OF THE WORLD* is published by Lynx Edicions, Passeig de Gracia, 12, 08007 - Barcelona, Spain.

F.W.

NEWS AND VIEWS

CANINDE MACAW OBSERVED

Although discovered way back in the early 1800s, the Blue-throated or Caninde Macaw *Ara glaucogularis* has remained a mysterious bird of uncertain status. Only now have observations on it in the wild been published by Otto Carlos Jordan and Charles A. Munn in the World Parrot Trust journal, *PsittaScene* 1994, 6, 1; 3.

They found it living in a seasonally inundated mosaic of savannahs, palm groves and low tropical forest in the Department of Beni in Amazonian Bolivia. Twenty-eight were observed at two adjacent sites and they learnt of two other small populations. Their observations suggest that these macaws eat the sticky sweet flesh of the ripe and nearly ripe fruits of the palm *Attalea phalerata*, which is abundant locally, and another palm *Acrocomia aculeata*. One pair was seen excavating a nest cavity in a palm tree and two nests were found in other palms.

Worldwide there are about 200 Blue-throated Macaws living in various collections, despite the fact that Bolivia outlawed the trade in this species back in 1984.

Malcolm Ellis.

* * *

RED OWL FOUND

Discovered in 1874, and last recorded in 1973, a Madagascar Red Owl *Tyto soumagnei* has been found in captivity in the town of Andapa. The bird was said to have been captured some 300 km. north of any previous sightings.

* * *

WHICH WHITE-EYE?

When it came to checking more than 70 lists after a 'Birdwatch' in Kenya, confusion arose because some participants used Williams' and Arlotts's popular field guide (Collins, 1980), and others *Birds of East Africa* (EANHS, 1980), edited by Britton, which uses a more recent classification/nomenclature, and which is followed in most scientific and semi-scientific publications in East Africa.

One point of confusion arose over the White-eyes. Williams, who pointed out that the classification of the East African White-eyes was unsatisfactory, listed five species, which were reduced to

three in *Birds of East Africa*. The one that he called the Kikuyu White-eye *Zosterops kikuyensis*, called sometimes *Z. senegalensis kikuyensis* is, in *Birds of East Africa*, treated as a race of the Montane White-eye *Z. poliogastra*.

Common in forest around Nairobi, the Kikuyu White-eye *Z. p. kikuyensis* is, moreover, considered to be confined to the highlands of central Kenya. That being so, as bird exports are not allowed from Kenya (but are from Tanzania), what then are the birds with the broad ring of white feathering around the eyes, available lately, which are being called 'Kikuyu White-eyes'?

The prime candidate would seem to be *Z. p. mbulensis*, which occurs in south-east Kenya and northern Tanzania. *Z. p. euryericota* also has a yellow belly, but lacks yellow on the forehead and *Z. p. winifredae* has a grey belly and flanks.

Malcolm Ellis

* * *

WILD BIRD BONUS

As well as being able to view one of the world's most impressive collections of wild animals, winter visitors to the San Diego Wild Animal Park are advised to bring binoculars and a suitable field guide to check out nearly 100 wild bird species which can be seen there.

Among them are a number of 'exotics' including Anna's *Calypte anna*, Costa's *C. costae* and Rufous Hummingbirds *Selasphorus rufus*, Cedar Waxwing *Bombicilla cedrorum*, Red-winged Blackbird *Agelaius phoeniceus*, Blue Grosbeak *Guiraca caerulea* and Northern Mockingbird *Mimus polyglottos*.

* * *

'BOMBER' HARRIS TACKLES PIGEON PROBLEM

Pigeons, whose droppings have despoiled the town centre of Longton near Stoke-on-Trent, have been put to flight by a trained bird of prey. Property developers refurbishing the area sought help from the Birds of Prey Centre at Lowther in Cumbria. The answer? Two handlers and a Harris Hawk. No blood appears to have been spilled for the pigeons outflow the predator. But the experts believe the hawk's presence will have been enough to scare them off permanently.

* * *

CRANE FLOCK EXTINCT ?

A flock of Siberian Cranes *Grus leucogeranus* which regularly wintered in India's Bharatpur sanctuary is believed to be extinct after declining in numbers since 1960 when 200 birds visited. In 1965, 125 arrived, 38 in 1982, six in 1992 and none in the most recent winter, 1993/4. The birds are thought to have been hunted along their traditional migration route across Pakistan and Afghanistan.

Six captive-bred Siberian Cranes which were released prior to the anticipated arrival of the wild flock, joined Common Cranes *Grus grus* during the winter but showed no inclination to fly north with them in spring.

Now, in a further attempt to restore the flock, Siberian Crane chicks will be raised using Common Cranes as surrogate parents in the hope that they will follow them on migration.

* * *

SADDLEBACK POPULATION INCREASES

At the end of the 1992/3 breeding season, the captive population of the North Island Saddleback *Creadion carunculatus rufusater* stood at just nine birds (3.3.3) in four collections. Pairs at both Mount Bruce and Otorahanga reared young and by the end of the 1993/4 season the population of these New Zealand wattlebirds had increased by 44 per cent to 13 birds.

Dave Coles

* * *

NEW BIRD HOUSES AT BELFAST

Part of Belfast Zoo's 60th birthday celebration in August included the opening of new Bird Houses and a Bird Park to mark the culmination of 15 years work and an expenditure of £10 million to redevelop the zoo.

* * *

BIRDS OF PREY DEREGISTRATION

In Britain it is no longer a legal requirement for birdkeepers to register and ring the three most common birds of prey - Kestrel *Falco tinnunculus*, Sparrowhawk *Accipiter nisus* and Common

Buzzard *Buteo buteo*. However, the onus remains on birdkeepers to show that these three species are held legally and it is recommended that they continue to be fitted with closed rings and detailed records are kept of the origin of each bird and all breeding results. Full details are available from the Department of the Environment, Bird Registration Section, Room 8/09, Tollgate House, Houlton Street, Bristol, BS2 9DJ.

Malcolm Ellis

* * *

LAPWINGS IN DECLINE

A report in the July-August 1994 edition of BTO News reveals a serious decline in Lapwing numbers in the UK. Although the long-term UK population trend shows a slow increase (which it is presumed is at least partly a recovery from losses in the exceptional cold of 1962/3) there has been a downturn after 1984. Thus, this year's drop in numbers, estimated at 32 per cent, continues a serious decline over the last 10 years.

* * *

WPA GIFT

The World Pheasant Association UK Chapter has made a gift of four pairs of Edwards' Pheasants *Lophura edwardsi* to Vietnam. On arrival the birds were handed over to Dan Goa Tung, Curator of Birds at Hanoi Zoological Gardens, who was quoted as saying that '... no wild Edwards' Pheasants had been seen in Vietnam for 20 years'. The WPA and Hanoi Zoological Gardens plan to co-operate regarding the conservation of pheasants in Vietnam.

Malcolm Ellis

* * *

SUCCESS WITH BALD EAGLES

Between 1986 and 1994, 10 parent-reared North American Bald Eagles *Haliaeetus leucocephalus* were raised at Christopher Marler's Flamingo Gardens and Zoological park at Weston Underwood, near Olney, Buckinghamshire. This year the pair laid three eggs all of which hatched and were being reared.

Malcolm Ellis

* * *

BREEDING RECORDS UPDATED

An indispensable publication for aviculturists intent on breeding non-domestic species is *FIRST BREEDING RECORDS FOR BIRDS REARED TO INDEPENDENCE UNDER CONTROLLED CONDITION IN THE UNITED KINGDOM*. Compiled by Avicultural Society member, Dave Coles it has now been available for a few years and costs £6.00. Copies can be obtained from Dave at 2, Church Farm Cottages, Lower Basildon, Berkshire, RG8 9NJ - and now each copy includes an updated list published earlier this year at no extra cost. Members who already have a copy of the original book can obtain the updated list from Dave on receipt of a large SAE.

* * *

RUDDY DUCK THREAT

The future of the White-headed Duck *Oxyura leucocephala* looks increasingly bleak in the face of threats from the Ruddy Duck *O. jamaicensis*, says Baz Hughes of the Wildfowl & Wetlands Trust. There are new developments in the continuing story of the Ruddy Duck's threat to the White-headed Duck, he says. Recent records of Ruddy Ducks wintering in Morocco suggest they may already have established themselves in that country, providing a further source of Ruddy Ducks much nearer to the Spanish breeding grounds of the White-headed Duck. The Moroccan authorities are making every effort to control birds which turn up there and had already shot two male Ruddy Ducks by March 1994. But the size and spread of the sites on which Ruddy Ducks occur make the Moroccans' task far from easy.

BTO News.

* * *

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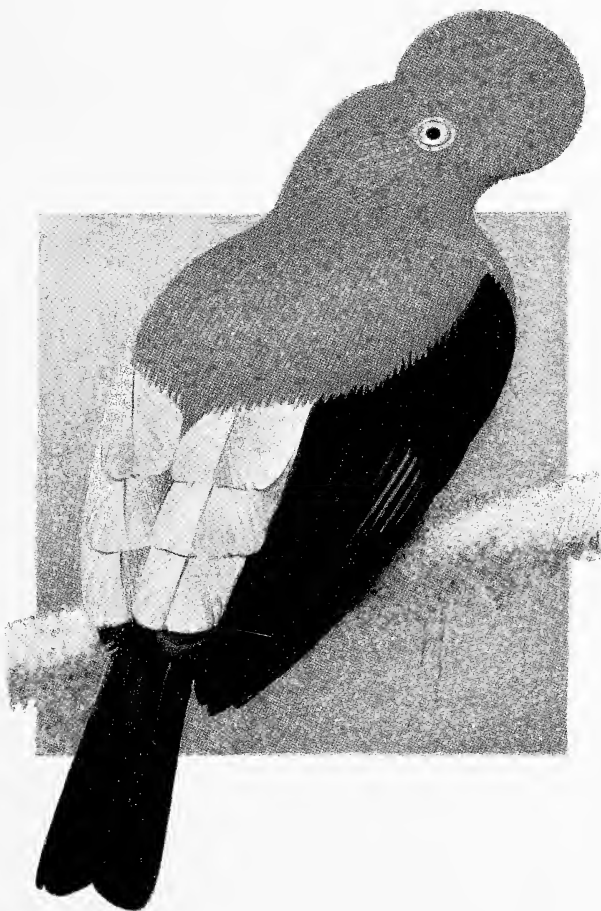
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ADDRESS OF EDITOR

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EDITORIAL

In common, I suspect, with many other contemporaries, Gouldian Finches were very much a part of my avicultural 'education'. I hope Members, unfamiliar with the trials and tribulations regularly experienced with imported stocks of these birds some 40 or more years ago, will take my word for the fact that if one succeeded in keeping - and eventually breeding - examples of these colourful grassfinches it represented a very marked upwards swing in the learning curve.

I still have a few Gouldians, together with other fondly remembered species from those formative years. And it is as a direct result of recent experiences with them that I find myself asking whether we can really expect conservationists to take seriously the fact that aviculture has much to contribute to the preservation of a growing list of threatened species.

During the past 24 months, my pairs of 'normal' Red-headed Gouldian Finches have produced some bonny youngsters, both Red-heads and Black-heads, but a majority moulted through to reveal white breasts, while others have a distinctive shade of lime-green suffusing the normal yellow undersurfaces.

In 1993 a recently acquired pair of 'normal' Diamond Doves reared eight squabs. My sons, two of whom work in UK zoos and are familiar with my views on mutations, paid close attention to the first two rapidly feathering youngsters, and were the first to congratulate me, with great hilarity, when one of them proved to be a silver - as was the case with subsequent rounds.

But it is important to re-emphasise a genuine cause for concern about present-day preoccupations with the production of mutations. Gouldian Finches are present in few public collections, at least in the UK. So what would be the situation if aviculturists were asked to contribute stock towards a future reintroduction programme?

Let us be clear - this is by no means a fictitious scenario, for the species is not far from the abyss in some parts of its range.

However enquiries made to a number of breeders in various parts of the UK over recent months has revealed the disquieting fact that aviculture might be hard-pressed indeed to provide suitable stock for such a project. For none of those contacted was prepared to guarantee their surplus *normal-coloured* birds would not produce various mutations.

Although not threatened in the wild, Chinese Painted Quail provide an even better (or worse, depending on one's point of view) example. Heaven forbid that we should ever dilute existing wild stocks with modern caricatures in which fawn, silver, khaki, earth-brown and other shades may be produced from the same sitting of eggs.

The wild forms of some Lovebird species also appear to be well on their way to avicultural extinction, while mutations of many other Parrot like species are proliferating like flies on a dung heap.

I do not question the right of knowledgeable and responsible aviculturists to propagate mutations. More worrying is the fact that surplus stock may be disposed of to individuals interested only in making money as quickly as possible through the irresponsible production of such birds. Indeed, I know of one enterprising partnership in which a breeder sells Rosa Bourke's Parrakeets through a chain of pet shops - where the birds are snapped up by unsuspecting members of the public who believe £50 is a reasonable price to pay for a rare 'Pink Budgerigar'.

It is not too much to hope that Members of the Avicultural Society, 100 years from now, will have reason to acknowledge the contribution made by their predecessors in the 20th century to the preservation of many species which might otherwise have been lost - either through extinction or uncontrolled breeding programmes.

F.W.

AVICULTURE'S CONTRIBUTIONS TO SCIENCE AND CONSERVATION

by Dr. Luis F. Baptista (USA)

The last century has witnessed many bird species in diverse taxa being bred in captivity. Some groups of birds, notably seedeaters, breed more readily under captive situations than others. It is not surprising then that seedeaters were among the first birds to be domesticated. The Rock Dove *Columba livia* and Greyleg Goose *Anser anser* were domesticated some 3,000 BC (Goodwin 1965, Sossinka 1982).

Understanding a bird's food habits and behaviour are prerequisite to successful breeding. Concomitant with our increased knowledge of dietary requirements came some spectacular breeding achievements. Hans Löhrl, my former boss at the Max Planck Institute, was the first to breed the Wallcreeper *Trichodroma muraria*. For this feat his good friend, the late Konrad Lorenz, declared him the world's greatest bird keeper. When I related this to him, he at once conceded the title to Ellen Thaler (formerly at Innsbruck Zoo) who bred Goldcrests and Flamecrests *Regulus* spp. (Thaler 1979).

Breeding hummingbirds is a great challenge. Cleveland Zoo bred Jamaican Streamertails *Trochilus polytmus* in 1959 (J. Lindholm, pers. comm.) and Isenberg (1962) bred Allen's Hummingbirds *Selasphorus sasin* in 1961. Several more species have been bred now and some, notably *Colibri* and *Amazilia* species, tend to be easier to breed than others. One of Wolfgang Grummt's proudest accomplishments is the breeding group of Sparkling Violet Ears *Colibri coruscans* he established in the east Berlin Tierpark.

My friends the Glotfelties of Pasadena, California, once bred Black-chinned Hummingbirds *Archilochus alexandri* using half a ping-pong ball filled with pasted-on-kapok to simulate a nest cup which was glued onto a perch. Two chicks fledged from this artificial "nest". So far, however, no one has managed to breed any of the Hermit Hummingbirds (e.g. *Phaethornis* spp., *Glaucis* spp.) or even maintain them in health for long periods. This feat will be one of the challenges of the next century. As these hummingbirds are spider specialists perhaps the answer lies in keeping quantities of small spiders as food.

As late as 1984, Jean Delacour believed that fruit doves were

impossible to breed in captivity. How elated he would be to know that several species are being bred (in the genera *Ptilinopus*, *Phapitreron*, *Treron*, *Ducula*), and at least one species, the Black-naped Fruit Dove *Ptilinopus melanospila* is being bred with regularity. Pheasant Pigeons *Otidiphaps nobilis* are being bred from time to time. Jürgen Nicolai had a pair that raised young in a basket placed on a ping-pong table. A pair at the Frankfurt Zoo raises young in a communal walk-through aviary. Unfortunately, most of the birds hatched in the United States of America tend to be hand-raised. It will be a challenge to establish lines of this magnificent species who will rear progeny on their own.

Other noteworthy breeding successes are the Lesser Broadbill *Calyptomena viridis* at Wuppertal and the San Diego Wild Animal Park, California, and Long-tailed Broadbill *Psarisomus dalhousiae* at the Frankfurt Zoo. For a long time Baikal Teal *Anas formosa* and Red-breasted Geese *Branta ruficollis* bred only rarely in captivity. Today both are bred with regularity. If one scans the pages of this journal and those of the *AFA Watchbird*, *Gefiederte Welt*, and *Trochilus*, one finds many impressive successes in addition to those mentioned above. Few of those species, however, are established in the hobby. With environmental awareness increasing throughout the world and with airlines pressured by animal rights organisations to stop the transportation of birds, aviculturists will find it increasingly difficult to acquire wild stock for their pens. The establishment of captive breeding lines are a first priority in the years ahead.

Beyond the aesthetic pleasure and companionship which birds provide, aviculture has contributed to several areas in science. Oskar Heinroth was probably one of the greatest aviculturists of our century. He managed to breed and/or hand-raise and study the behaviour ontogeny of an innumerable number of European birds, and published his observations with Magdalena Heinroth in their classic four volume opus "*Die Vögel Mitteleuropas*". The Heinroths kept tame European Nightjars *Caprimulgus europaeus* in their living room where a pair raised young on a peccary skin rug. Heinroth's intimacy with waterfowl led him to discover the phenomenon of behavioural homology, i.e. behaviour patterns may be inherited as are morphological characters, so that related species will have similar behaviours, probably controlled by the same genes. His brilliant student, Konrad Lorenz, expanded on these ideas, and went on to win the Nobel Prize for these and other advancements in the field of ethology. Lorenz's observations on

the behaviour of waterfowl have appeared in the pages of this magazine (Lorenz 1951-53). These pioneering studies on waterfowl and others that followed enabled Delacour and Mayr (1945) to revise the genera of waterfowl, combining behavioural with morphological characters in classification, another classic study.

The many mutations that have appeared among captives of so many taxa have enabled aviculturists and scientists to study many principles of inheritance. One of the most incredible stories in ornithology is that of polymorphism in Seed-crackers *Pyrenestes ostrinus*. Large-billed, small-billed, and megabilled individuals occur in the same population in Cameroon, Africa, and hatch from eggs laid in the same nest. Birds equipped with each bill size feed on seeds of certain size ranges during the breeding season and thus avoid competition. Thanks to the magnificent breeding colony of these finches maintained at the Riverbanks Zoo in South Carolina by Bob Siebel, Smith (1993) was able to establish that the inheritance of bill size is a simple Mendelian dominance.

Many seed-eating and insectivorous song birds (Oscines) have been shown to learn vocalisations from adults of their species. Thanks to improved diets, Anna's Hummingbirds *Calypte anna* may be maintained in captivity and studies have revealed that despite their primitive syringes, these hummingbirds may learn very complex song (Baptista and Schuchmann 1990). Advances in aviculture have enabled scientists to keep birds in health and study learning and heritability of a variety of behavioural and vocal patterns in a host of taxa (Baptista and Horblit 1990; review in Baptista 1994).

Captive birds have contributed much to our knowledge of brain functions. One of the noteworthy discoveries of the century is that certain brain centres in canaries *Serinus canarius* and other species (Nottebohm 1993, review in Baptista and Gaunt 1994) undergo an annual cycle of expanding and shrinking mediated by lengthening and shortening day lengths of the various seasons. A mutation has appeared among Belgian Waterschlager canaries that leads to early deafness so that these canaries are now being used as a model to study hearing degeneration in humans (Gahr, pers. comm.).

Last but not least are aviculture's contributions to the field of conservation. The most spectacular success story is the breeding/release programme of the Peregrine Falcon *Falco peregrinus* by Tom Cade and his colleagues (Cade and Hadaswick 1985). This species was extinct on the east coast, and through the co-operation of private breeders and Cade's programme, peregrines once more

traverse the skies of eastern North America and many other parts of the continent. The Lammergeier *Gypaetus barbatus* breeding/release programme in Europe is another such success story in the making.

Some species that are rare or endangered (or even extinct) in the wild are more numerous in captivity than they are in nature. Rothschild's Starling *Leucopsar rothschildi* and Edwards' Pheasant *Lophura edwardsi* are examples. In 1978 and 1981 several Canadian and North American ornithologists visited Socorro Island in the Revillagigedo Archipelago, 400 miles off the west coast of Mexico. They found to their dismay that the Socorro Island Dove *Zenaida graysoni* had gone extinct due probably to a combination of reasons including feral cat predation, habitat destruction by sheep and possibly overhunting.

Jean Delacour and Frank Todd put me in touch with a number of dove breeders and to our delight we found that Socorro Doves still thrived in their collections. A few birds eventually made their way to Europe (Nicolai 1991). Theo Pagel of Cologne Zoo and Stefan Stadler of Frankfurt Zoo are now co-ordinating a breeding programme for this species in Germany and Stefan is keeping the studbook. Some friends of mine and I founded Island Endemics Institute, an organization dedicated to the breeding and repatriation of the Socorro Dove to its ancestral home. Facilities are being built to have a breeding programme in California, USA, parallel to that in Germany.

Meanwhile my colleague Hartmut Walter from the University of California at Los Angeles and I have collaborated with Mexican wildlife biologists in faunal and floral surveys of the island and in drafting a recovery plan (Baptista 1993). President Salinas of Mexico signed a decree on 6 June, 1994, declaring Isla Socorro and the Revillagigedos a Biosphere Reserve.

Isla Socorro will henceforth be jointly administered by Mexico's wildlife biologists (SEDESOL) and navy, and visits will be restricted. No hunting will be permitted so that released birds will be unmolested by humans. We are meanwhile collecting blood from doves and conducting DNA-fingerprinting studies to determine genetic relatedness of captive stock to plan pairings for maximum outcrossing. Private breeders are also involved in this programme in helping to breed birds for release, but also to act as reserves in case some misfortune leads to the extirpation of birds in the large breeding centres.

Ultimately, it will be up to aviculturists along with zoos to

maintain gene-pools of birds that will be extinct in the wild as habitats disappear. Because there are so many species in need of help and so few that may be helped some might argue that aviculture's role in conservation will not be large. This may be true if we count the actual number of species that will be saved by aviculture per se. However, we must not lose sight of the greater role aviculture plays in creating awareness in the general populace of these beautiful creatures and their plight. Also, in trying to save one or two species one often has to prepare a habitat to receive those species and in so doing the programme may actually be preserving substantial tracts of entire ecosystems, thus saving many plant and animal taxa.

Again I draw as an example the Socorro Dove breeding/recovery programme. In organising the programme we have had to draw on the expertise of Mexican, North American, German and New Zealand scientists and aviculturists. In restoring the islands we are saving a flora with an endemism rate of 31.6% (Levin and Moran 1989) and several endemic landbirds (10 species on Isla Socorro). The latter include an endemic genus, the Socorro Mockingbird *Mimodes graysoni*. Once thought to be close to extinction (Jehl and Parkes 1982), banding studies by Juan Martinez of Vera Cruz, Mexico (now at Villanova University, Pennsylvania, USA) has revealed over 200 individuals. Although the picture is rosier for this species they are not yet out of danger by any means.

Juan's ecological studies will be critical to their preservation as knowledge of their life history will guide wildlife biologists in their work. Because of destruction of forest tracts a savannah-like habitat has been created on the south part of Socorro Island, ideal environs for Northern Mockingbirds *Mimus polyglottos* who have invaded. Juan has been looking at possible competition between invading *Mimus* and the resident *Mimodes*.

Where the two species meet in the south, some *Mimodes* have adopted the songs of the invading *Mimus* (Baptista 1993). In the brushy northern part of the island where *Mimus* is still absent, *Mimodes* still sings its ancestral song. Will the status quo hold or will *Mimus* eventually adapt and invade the rest of the island? Also could it be possible that when the island is restored and forest and chaparral habitat return to Socorro, *Mimus* numbers will decrease? The Mockingbird story is only one of many in this most exciting conservation project. The Socorro Dove is the banner species of a much larger programme involving laity and professionals of several nations.

Aviculture has learned much over the last century: diets have improved, our knowledge of biology and life history of birds have increased, breeding successes of delicate and difficult species have multiplied, and Aviculture has proven her role as a tool in studying ornithology and in conservation. Happy 100th birthday, Avicultural Society!

REFERENCES

- BAPTISTA, L. F. 1993. A letter from the field: the birds of Socorro Island. *Pacific Discovery* **46**:44-47.
- BAPTISTA, L. F. 1994. Nature and its nurturing in avian vocal development. *Ecology and Evolution of Acoustic Communication among Birds*, D. E. Kroodsma and E. H. Miller, Eds. Cornell University Press. In press.
- BAPTISTA, L. F. and H. M. HORBLIT. 1990. Inheritance and loss of the straw display in estrildid finches. *Avicultural Magazine* **96**:141-152.
- BAPTISTA, L. F. and K. L. SCHUCHMANN. 1990. Song learning in the Anna Hummingbird *Calypte anna*. *Ethology*, **84**:15-26.
- BAPTISTA, L. F., and S. L. L. GAUNT. 1994. Historical Perspectives: Advances in studies of Avian Sound Communication. *Condor* **96**:817-832.
- CADE, T. J., and V. J. HARDASWICK. 1985. Summary of peregrine falcon production and re-introduction by the Peregrine Fund in the United States, 1973-1984. *Avicultural Magazine* **91**:79-92.
- DELACOUR, J., and E. MAYR. 1945. The family Anatidae. *Wil. Bull.* **57**:3-55.
- GOODWIN, D. 1965. Instructions for Young Ornithologists VI. *DOMESTIC BIRDS*. London, Museum Press Ltd.
- ISENBERG A. H. 1962. The breeding of Allen's Hummingbirds. *Avicultural Magazine* **68**:86-88.
- JEHL, J. R., and K. C. PARKES. 1982. The status of the avifauna of the Revillagigedo Islands. *Wil. Bull.* **94**:1-19.
- LEVIN, G. A., and R. MORAN. 1989. The Vascular Flora of Isla Socorro, Mexico. *Memoir 16*, San Diego Nat. Hist. Mus.
- LORENZ, K. 1951-1953. Comparative studies on the behaviour of the Anatidae. *Avicultural Magazine* **57**:157-82; **58**:8-17, **61**:72, 86-94, 172-184; **59**:24-34, 80-91.
- NICOLAI, J. 1991. Letzte Chance für die Socorro-Taube. *Tropische Vögel*. **12**: 55-60.
- NOTTEBOHM, F. 1993. The search for neural mechanisms that define the sensitive period for song learning in birds. *Netherlands J. Zool.* **43**:193-234.
- SMITH, T. B. 1993. Disruptive selection and the genetic basis of bill size polymorphism in the African finch *Pyrenestes*, *Nature* **363**:618-619.
- SOSSINKA, R. 1982. Domestication in Birds. Pages 373-403 in *Avian Biology*, vol. 6 (D.S. Farner, J.R. King, and K.C. Parkes Eds). Academic Press, New York.
- THALER, E. 1979. Das aktionssystem von Winter-und Sommergoldhähnchen *Regulus regulus*, *R. ignicapillus* und deren Ethologische differenzierung. *Bonn. Zool. Monog.*, **12**:7-151.

BREEDING THE BLACK-BACKED FRUIT DOVE, AT LONDON ZOO

By T. A. Webb and D. Robinson

(Bird Department, London Zoo, Regent's Park, London.)

Introduction

The Black-backed Fruit Dove *Ptilinopus cinctus* is a medium-sized fruit dove from the Lesser Sunda Islands, with a range extending from Bali in the west, extending through to Tanimbar in the east. A closely related form, the Black-banded Fruit Dove *Ptilinopus alligator*, is found in a small area of the Northern Territory of Australia.

Description

Adult birds have a white, or pale grey, head, nape and upper breast. The back, wings and tail are black, and there is a broad black band across the middle of the breast. The lower breast is pale grey, and the under tail coverts are greenish grey. The eye is red, the bill is grey-green with a yellow tip and the legs are red. There is some sub-specific variation, which is imperfectly described. However, following White & Bruce (1986), our birds have been provisionally identified as belonging to the sub-species *alboininctus*, from the islands of Lombok, Sumbawa, Flores and Bali.

History

London Zoo purchased a trio of birds from a private collection in October 1993. Apparently they had been imported from the wild during 1990. Shortly afterwards they were sexed by Vetgen as two males and one female. In January 1994, one male apparently flew into the wire roof of the aviary and was found dead. The remaining pair were introduced to each other on 18th April 1994. They were housed in an aviary with a large flight, measuring 4 metres wide by 5 metres long and 4 metres in height, with an inside den of 4 by 4 metres, with a 4 metre apex roof. The birds shared the aviary with a Grey Francolin *Francolinus pondicerianus*, two Rose-coloured Starlings *Sturnus roseus*, a Bali Mynah *Leucopsar rothschildi* and an Asian Pied Starling *Sturnus contra*.

Diet

The basic diet, fed at about 10.30 am daily was diced tomato, apple, pear, banana, grape, soaked sultanas, Prosecto, turkey pellet, boiled egg, boiled soya bean, boiled rice, boiled potato and carrot. In addition, seasonally available fruits were added.

Breeding

Following introduction, the birds settled together very quickly, and, on 2nd May, were observed sitting. The nest site was in the indoor flight, in a small 10 by 10 cm nest pan, close to an old conifer tree, wired to one of the walls. The doves had collected a small amount of grass and placed it on the mesh of the nest pan, but otherwise no attempt at nest building was made. One egg was laid, but, on 10th May, it was deserted and was found to be infertile.

The birds were very nervous and cage maintenance was kept to a minimum. On 31st May, they were observed sitting once again. Because of the difficulty of observing them, it was not clear whether both birds shared incubation. On 21st June, after an incubation period of 21 days, a single egg shell was found on the floor of the cage. It appeared to result from a good hatch. No observations were made of adult/chick interactions, but the chick fledged at 14 days.



Juvenile Black-backed Fruit Dove photographed at London Zoo

At fledging, it was approximately one third adult size and still had traces of down in its plumage. The head, neck and breast were pale grey, with yellow edges to the feathers and the back and wings and tail were bronze green with yellow flecking. The eyes were dark brown, with blue orbital skin. The bill was blue grey and the legs were pink. Following fledging, the adults were not seen to feed the chick.

The chick was removed from the aviary on 29th July, when it appeared that the adult birds might be going to nest again. Shortly after it was removed, it scalped itself on the roof of its aviary, but the damage was superficial and was treated successfully with antibiotics. *Ptilinopus cinctus* seems to be a nervous bird, inclined to sudden flights into the roof or walls of the aviary, so care should be taken to avoid sudden disturbance.

A number of fruit pigeon species have been imported into the United Kingdom in recent years; most of them have reproduced successfully and the genus seems relatively uncomplicated in captivity. We have not been able to find any reference to reproduction in this species. The only previous captive hatching that we are aware of was at the San Diego Zoo in 1991, Olney & Ellis (1994).

References

- GOODWIN, D. (1983): *Pigeons and Doves of the World* (3rd Edition). British Museum and Cornell University Press.
- OLNEY, P. J. S. & ELLIS P. (ed) (1994): *International Zoo Yearbook* Vol. 32. Zoological Society of London.
- WHITE, C. M. N. & BRUCE M. B. (1986): *The Birds of Wallacea*. British Ornithologists Union.

Products Mentioned

Turkey Pellet: Turkey breeder pellet manufactured by:
Spillers Dalgety, Dalgety Agriculture (CY), 180 Aztec West, Bristol, BS12 4TH

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THE TRI-COLOURED MUNIA AND THE CHESTNUT MUNIA - TWO GOOD SPECIES?

By: Robin L. Restall, Hong Kong.

In his seminal revision of the subfamily *estrildinae* in 1943, Jean Delacour united three separate munia species into one. The three were *Lonchura malacca*, *L. atricapilla* and *L. ferruginosa*. He gave the name *ferruginosa* for the combined species, over-looking the fact that *Loxia malacca* Linnaeus (1766) antedates *Loxia ferruginosa* Sparrmann (1789). Since then several authors have questioned the wisdom of this. Wolters (1979) regarded *L. ferruginosa* as a good species and Sibley and Monroe (1990) follow him. Goodwin separated *L. malacca*, *L. atricapilla* and *L. ferruginosa* into three groups but retained them as a single species, other writers generally follow suit, but there is a trend to regard *L. ferruginosa* as a good species, e.g. MacKinnon and Phillipps (1994). The specific integrity of *L. ferruginosa* now appears to be beyond doubt and I certainly feel it should be treated as a good species. Considering the detail of all this and regardless of the status of *L. ferruginosa*, I have come to the conclusion that *L. malacca* and *L. atricapilla* must be regarded as distinct species. The reasons are as follows.

The Tri-coloured Munia *L. malacca* occupies a clearly demarcated range within India, quite separated from *L. atricapilla* by a strip of land some 250 km between the two at the closest point (Ali and Ripley 1987). In contrast, *L. atricapilla* has an extensive sprawling range within which various sub-species intergrade and even overlap.

Within *L. malacca* there are five distinct morphs, by far the commonest being the familiar black-headed chestnut-backed bird with a white breast band and white flanks, and a clearly-defined black belly patch running into black undertail-coverts. This form accounts for 95% or more of any population. The first of the four variants has a noticeably irregular zig-zagging of the division between the black and the white on the flanks. The second has a fine wavy black barring over the white feathers similar in pattern to that on the African Silverbill *L. cantans*. The third has a very light cinnamon wash over the white with the edges of the feathers darker cinnamon, giving a scalloped appearance; and the fourth has the white replaced by an even cinnamon. Obviously the species has a

propensity for colour variation **on the white**. Only one of these resembles *L. atricapilla*, and that is the cinnamon-flanked variant. But when compared side-by-side, the cinnamon flanks of this form of *L. malacca* do not match any of the variations of *L. atricapilla*.

In contrast there is considerable variation within the different geographic forms of the Chestnut Munia *L. atricapilla*. The different races have varying shades of brown on the upper surfaces, including a pale scalloping on the mantle. There are also different shades of brown on the breast and flanks, and a considerable variety of colouring of the rump, uppertail-coverts and tail. In addition there are variations of head colouring, both from race to race and sometimes within a race, from black to brown and even pale grey on the nape. The belly varies from an extensive irregular black to a total absence of black, the belly and vent to undertail-coverts being the same brown as the flanks. In all this variation, within which there are many confusing intergrades and some abrupt contrasts, there is no clear trend nor cline. All the variation is of **the black and brown**.

More significantly there are no cases of morphs showing white anywhere on the body, let alone on the breast and flanks.

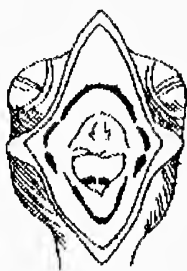
Although I have not been able to hold live nestlings side by side for direct comparison, it appears that the palate markings of *L. malacca* are different from those of *L. atricapilla*.

In my experience, in behavioural terms *L. malacca* and *L. atricapilla* self-select for partners and pair bonding, in preference to crossing or mixing both in the wild and in captivity. Both species occur in Hong Kong where *L. atricapilla* is a migratory summer visitor, and the introduced *L. malacca* is a resident. Mixed pairs have not been recorded. It has been reported that intermediates between the two species occur (Viney *et al* 1994) but I understand from Clive Viney (*in litt*) that this conclusion was based on observations of seeing both species entering the same reed beds carrying nesting material. These would almost certainly have been male birds in every case, with which cross-breeding is unlikely. It would be impossible to divine the parentage of juveniles or moulting first year birds without seeing fledglings being fed by the parents. It seems certain that the two species do not interbreed in Mai Po.

In the light of his reasoning I find a case for regarding *L. malacca* and *L. atricapilla* as separate species irresistible. I am certain that there are members of the Avicultural Society who will have some experiences or observations that could bear on the

subject, one way or the other. I would be most grateful for any input however insignificant it might seem. Please write to me care of the Editor.

Incidentally, there is a plumage variant known in *L. ferruginosa*. This differs from either of the foregoing species. It is only found on the male and has the black of the underparts extending from the bib right to the undertail-coverts with little or no chestnut on the flanks at all (and that covered by the folded wings). It would be invaluable to see the palate markings of the nestling *L. ferruginosa*. Does anybody know of a reference please?



Tri-coloured Munia



Chestnut Munia

Palate markings of L. malacca, left, and L. a. atricapilla, right.

References:

- ALI, S., and RIPLEY, S., D. (1987) *Birds of India and Pakistan*. Oxford, Bombay.
- DELACOUR, J. (1943) A Revision of the Sub-family Estrildinae of the Family Ploidae. *Zoologica*, 28:69-86.
- GOODWIN, D. (1982) *Estrildid Finches of the World* Brit. Mus. Nat. Hist., London.
- MACKINNON, J., and PHILLIPPS, K. (1994) *A Field Guide to the Birds of Borneo, Sumatra Java and Bali*. O.U.P.
- RESTALL, R., L. (1995) Proposed Additions to the Genus *Lonchura* (Estrildinae). *Bull. B. O. U.*, London.
- SIBLEY, C., G., and MONROE, B., L., Jr. (1990) *Distribution and Taxonomy of Birds of the World*. Yale.
- VINEY, C., PHILLIPPS K., and LIM, K., C. (1994) *The Birds of Hong Kong and South China*. Hong Kong Gov't.
- WOLTERS, H., E. (1979) *Die Vogelarten der Erde*, (page 287). Paul Parey, Hamburg and Berlin.

**JEAN DELACOUR AND THE AVICULTURAL
MAGAZINE
PART (III) 1945 - 1969**

Josef H. Lindholm III,
(Keeper II/Birds, Fort Worth Zoological Park)

As it happens, both the first and second quarter centuries of the Avicultural Society approached their conclusions in the midst of the darkest occasions of the 20th Century. While 1919 found Jean Delacour contemplating the utter destruction of his aviaries at Villers-Bretonneux yet forging ahead with the establishment of his new estate at Clères, 1944 found him ensconced as Technical Adviser to the New York Zoological Society, uncertain as to what had become of his incomparable collection in then-occupied Normandy.

Delacour was 55 in 1945, yet, as we shall see, the next 25 years were wonderfully active and rich with achievements.

'I have long been personally interested in waterfowl. For over twenty years I kept at Clères several hundreds of these fascinating birds... under almost natural conditions and many of them were breeding regularly. This enabled me to make countless observations which were extremely valuable for the understanding of their relationship.

'I had already published several articles on the subject... Since, however, more has been learned, and at the suggestion of several American ornithologists, Dr Ernst Mayr and I decided to sum up our knowledge in a new more important paper in English. Our study has been published in *The Wilson Bulletin*, vol 57, 1st March, 1945 (pp. 1-53), and I refer it to all persons interested. Our object has been to effect a more natural grouping of species, with a better understanding of their affinities expressed in a simpler taxonomy.

'The conventional classification of waterfowl usually so far adopted is founded on a small selection of morphological characters, primarily the shape of the bill, legs and feet. Nothing could be more misleading, as these are entirely functional and undoubtedly often recently acquired, representing merely a secondary adaptation, that is repeated in widely separate groups. We have used on the contrary a number of nonadaptive characters: pattern of tarsus, plumage pattern in adults and chicks, posture, general

body proportions, length of neck and shape of head, internal anatomy and more particularly biological peculiarities. Habits and behaviour are of paramount importance, for they are deeply rooted and usually the product of very ancient evolution...

'We believe in large genera, since it is the function of generic names to express relationship not distinctness, which is expressed by the species names'...

(The Family Anatidae July-August, 1945 (Series V), Vol. X, 93-102.)

With several modifications, Delacour and Mayr's system of Waterfowl classification remains the generally accepted one. It is recognised as a pioneering application of the Phylogenetic approach to taxonomy.

'...All this is a thing of the past at Clères. But Mr F.E. Fooks is back there, and this past has a fair chance to be partly revived in the near future. As a link, I hear that a Festive Amazon, which we brought over from South America and liberated in 1921, is still today flying around the Manor House and the terrace. If he could talk better than he does, he would no doubt tell much, and some of his stories would probably bring tears to all my friends who knew Clères in its former splendour'.

(Birds at semi-liberty at Villers Bretonneux and at Clères(1905 - 1940), March-April, 1946 Vol. LII, 64-65.)

'The problem of exhibiting cage birds in public zoos is a difficult one. Until recently it has been tackled rather crudely. Too often just rows of wire cages are lined up on shelves... practically never before has it been attempted to show the birds under the best conditions of light... For many years I had planned to build a special hall, the walls of which would have had glass openings, giving view to birds and fishes. Cages and aquariums would have been decorated and planted. The effect would have been that of so many animated, living pictures. They would be set up in a wide corridor encircling the hall, where all facilities would be provided for cleaning and for the care of the creatures.

'The centuries-old rooms at Clères, with all their historic interest, did not allow for such a scheme. But I had hoped to build a special house some day... Fate has decided otherwise... However, I had the chance to achieve at the New York Zoo for the public what I once had dreamed to do at home for my own satisfaction. The result has been what we call the 'Jewel Room'.

'The Bird House in New York consists of three halls, the largest of which has not been much altered these last years. We have only

redecorated the big central flight and some of the compartments. The second room has been completely changed in 1942. The numerous cages and small compartments for Parrots and Doves have been removed, and five roomy flights have replaced them. They are decorated and planted so that they now form the "New England Garden", for native species; "Arid Plain", for desert birds; "Indo-Malayan Jungle"...; "Tropical American Rain Forest".

'The third hall was particularly unattractive in its former state: a large room... with an ugly glass roof and plainly built compartments all around... They were badly lit, and none of the beautiful colours or metallic reflections of the inmates could be seen at real advantage. It was the more unfortunate that it always housed a wonderful collection. This hall has been entirely renovated during the winter of 1945...

'The transformation has been comparatively simple and easy - a smaller room has been built inside the hall, entirely dark but for the light which comes through the glass front of the cages that open in the walls... The cages form two groups... Those of the first... ten in number and of three different sizes, are dedicated to Humming Birds. The others consist of one large (10 ft. by 11 ft.), unplanted but nicely decorated aviary mostly for hardbills, of two fair-sized planted compartments (5½ ft by 5 ft) and seven smaller ones (3½ ft by 3 ft). They are at present occupied by a Fairy Bluebird, a Rothschild's Starling, a Cock-of-the-Rock, and a number of Manakins, Sugarbirds and small Tanagers, which are doing exceptionally well in such quarters... It looks like Gould's plates, but it is alive'...

(The Jewel House in the New York Zoo. July-August, 1946 Vol. LII, 123-125.)

For further details of Captain Delacour's work at the New York Zoological Park, the reader is referred to an earlier article (Lindholm, 1988).

'In 1940 there were nearly 500 waterfowl at Clères. All the known species of geese, Sheldducks and Treeducks were represented, also all the ducks and swans with the exception of about twenty-five.

'In 1945, practically nothing remained all have been killed or removed. A lone Whooper Swan, a couple of Common Sheldducks, a dozen or so hybrids between Mallards, Meller's and Black Ducks, some three-quarter-bred Yellowbills, a few diving Ducks, which look like a darker and more elongated Scaup (Probably with White-eye and Redhead blood), and oddly enough a male Sharp-winged

Teal and a female Bufflehead. According to Monsieur Georges Olivier there were still a number of birds till the final slaughter in 1944, and during the occupation Cape and Sharp-winged Teal had reared broods on the Lake.

'In 1946 Mr Spedan Lewis kindly presented us with a good collection: a pair of Black Swans, Emperor, Greater Snow, Magellan, Ruddy-headed, Blue-winged Geese, South African Sheldducks, and Red-crested Pochards. The Paris Zoo contributed Emperor, Red-breasted, Bar-headed, Egyptian, and Cereopsis Geese and Mute and Whooper Swans. Major Pam reared Blue Snow Geese for us. Mandarins and Carolinas arrived from America... while Chiloe Wigeon, Rosy-bills, Tufted and Bahama Ducks. and Ashy-headed Geese are coming from Leckford, more Ruddy-headed Geese from Foxwarren, more Bar-headed and Barnacle from Wormly Bury, Paradise Sheldducks from Whipsnade, and a couple of dozen species of the various European ducks from Mr Schuyt in Holland. Many species of course are, and will long be, missing, particularly the Tree Ducks, now vanished from Europe, and all the sea-ducks of which we used to keep such a wonderful collection...

'My old breeding pair of Black-necked Swans, that for twenty years reared their young at Clères have naturally vanished, and the species is now terribly scarce in captivity. But pairs of their offspring at Leckford and in Holland, at Mr Schuyt's, have bred this year and I hope that later on, a new Black-necked menage will replace their grandparents in the pretty pool by the waterfall at the end of the lake, now temporarily occupied by a handsome but vulgar pair of Mute Swans.

'While I was in England last spring and summer I was delighted to see how extraordinarily successful Mr Terry Jones was at Leckford in rearing young waterfowl..., often the offspring of old, worn-looking pairs. If many interesting species have been saved for aviculture we owe it to him'.

(Waterfowl at Clères in 1947. November-December, 1947 Vol. LIII, 198-199.)

'Soon after my return from Europe, I went on my annual tour of inspection of the Trumpeter Swan's refuges'.

'Two conclusions are obvious. First, In the wild state under the present circumstances the annual crop of cygnets is practically wasted. The Red Rock Lakes Refuge is already over-stocked and the surplus population leaves it, only to die of starvation or lack of water, or to be illegally shot outside. We did not capture any cygnets in 1946 nor in 1947 in order to find out whether or not the

previous captures had affected the level of the wild stock. The answer has been that it did not in the least. It seems, therefore, preferable to capture more young birds every year. Second, it is hopeless to expect this large sedentary species to thrive in unprotected parts of the country now settled by man. Enforcement of the law is well nigh impossible in these remote thinly inhabited highlands. Our programme of propagation of the species under control appears to be sound. The captive birds at Malheur Lake (Oregon) are doing well and the 1944 pairs should start breeding next spring in separate pens. I have just transferred twelve 1945 birds to the Ruby Lake Refuge, Nevada,... where we hope to establish later on the young Swans which may be reared by these captive pairs'...

(Waterfowl notes from the western United States. November-December, 1947 Vol. LIII, 215-217.)

'...The Scarlet subspecies, however,... is the only one to have been imported alive so far... It is the finest of all and the only true Scarlet one. It was first brought alive to New York in December, 1941, by C. Cordier, who landed twelve specimens..., three of which remained at the Bronx Zoo, the others going to other zoos and a pair to Mrs Milton Erlanger... At the time of writing, two of the original males are still living at the Bronx Zoo in perfect condition, if a little faded in colour. One has been sharing for a few years a large planted compartment with Quetzals, Umbrella Birds, Tanagers, and several other birds, and there has been no quarrels.

'Since Mr Cordier's visit in 1941, the inhabitants of South-western Colombia who had learnt from him how to catch and to feed Scarlet Cocks-of-the-Rock, have recently sent a few every year to the Louis Ruhe firm in New York. The same thing happened with Quetzals in Costa Rica, so that these two marvellous species are well represented at present in American collections'...

(The Scarlet Cock-of-the-Rock. January-February, 1948 Vol. LIV, 1-2.1

Dr William G. Conway informed me in September, 1994 that Charles Cordier had died that month in Switzerland. at the age of 97. He had sent his final shipments from Bolivia in 1983.

'We went to see Mme Y. Malisoux, at Béez, near Namur. The loss of M. Yvan Malisoux, soon after the liberation of Belgium, has deprived aviculture of one of the most intelligent, observant, and capable breeders of Pheasants. Mme Malisoux carries on courageously with a few rare species. Today she keeps three pairs of Satyrs and three of Blyth's Tragopans, the latter being the only

good stock left in captivity. This year 13 Satyrs and 2 Blyth's have been reared; some of the Satyrs belong to the fifth generation bred in captivity. They are extremely well fed and cared for so that they have not deteriorated in the least degree. Mme Malisoux also possesses a pair of Palawan Peacock Pheasants, and she has recently added Amhersts, Mikado, Grey Peacock Pheasants, from the Leckford Collection. During the war birds were kept and reared at Bézé quite successfully, particularly the difficult Indian Koklass, which, Mme Malisoux says, gave no trouble at all, a happy exception with these delicate mountain birds

* * *

Postscript. - I have just heard burglars have stolen and killed all of Madame Malisoux's Tragopans except one pair of Blyth's and one of Satyrs. A shocking loss.

(Belgian aviaries January-February, 1949. Vol. LV, 29-30.)

...When I saw Clères on 7th June, 1940, for the last time until the autumn of 1946, the grounds had already been bombed heavily twice, and many animals and birds had been killed; but for craters and damaged trees, the park still looked lovely, with hundreds of creatures all about the place...

'...When Mr Fooks was allowed to come to Clères in 1945, one Muntjac, one Crane, some Junglefowl, a Swan, and a few Ducks only remained.

'Mr Fooks had reported that, empty and spoiled as it was, Clères could be restored. I then decided that he should return, which he was eager to do, and resume managing the estate as he had done so well in the past twenty-five years. Despite tremendous difficulties, which further occupation by Allied troops did not alleviate although they proved helpful and considerate, most of the park, the gardens, and the aviaries were soon put in order. When I returned in September, I was agreeably surprised at the results of Mr Fooks' work. The place looked much as before in a general way, and it was already fairly well stocked, thanks to the generosity of... Mr Spedan Lewis... and Major A. Pam... Also Professor A. Urbain, Director of the Paris Museum, had returned birds which he had kept for us during the war, and loaned many others and some animals. It may be said here that I have bequeathed Clères and the adjoining property to the National Museum in order to ensure its future as far as can be done in these troubled times...

'Clères was officially reopened on 25th May, 1947 by M. Andre

Narie, Vice-Premier and Minister of Justice, accompanied by all the authorities of Normandy, the British and American consuls, the Director of the National Museum, and the delegates of numerous scientific institutions and societies; many of my friends were there, among them Miss Barclay-Smith... and Mr Peter Scott. To me it was a very moving occasion.

‘Since that day Clères has been a public park, where visitors are admitted every day and may wander as they please, the gate takings paying for most of the upkeep...

‘...The main aviaries have been done up, as also a good part of the pheasantries, the rest being damaged beyond repair... The tropical houses and indoor bird galleries, however, are a total loss, and it is hardly worth while reconstructing them as long as fuel and special foods are not available...

‘...I could even obtain a pair of the rare Imperial Pheasant, which I discovered in Indo-China in 1923; there are still a few of them in American aviaries, all descendants from the original pair which bred at Clères for the first time in 1925; it is nice to see them again where their ancestors lived before... Among the Doves, most of the Australian species are represented, including the pretty Brush Bronzewing, Philippine Cuckoo-Doves, Grayson’s, Bleedinghearts, and African Blue-headed *puella* Budgerigars of many new colours, Fischer’s Lovebirds make a good show in some of the aviaries, while a pre-war pair of King Parrakeets, which spent several years in a cage in Paris, have bred the last two seasons... Other aviaries are well stocked with Glossy Starlings, Weavers, Whydahs, Waxbills, and other seed-eating birds from Senegal, easy to obtain in France at present. In spite of great difficulty with labour and food, a number of birds have been reared the last three years.

‘...as a home, Clères hardly exists for me to-day; but the site remains, picturesque and harmonious. If I never again can completely enjoy it as I did in the past, since so much I loved is missing, others can derive pleasure from it. It was, I think, my duty to preserve Clères to the utmost of my power...

‘...In many ways, it is painfully different to-day, but it has kept a great deal of its former charm, and glorious memories still dwell under its tall trees, along its transparent waters, and in its ancient stones. And gorgeous birds still live, call, sing, and nest in the romantic old park.

(The re-birth of Clères. March-April, 1949 Vol. LV, 62-66.)

‘Since my return from Europe at the end of August, 1949, I have

had the pleasure of visiting many of my aviculturist friends in different parts of the United States...

'In the vicinity of New York one of the first week-end visits was to Mrs Erlanger's country place at Elberon, New Jersey. There is certainly the choicest collection of small birds in eastern North America... In a long garden aviary along the house, during the summer are kept such insectivorous species as the Red-bellied Niltava, White-capped Redstart, Indian Crested Tit, Fork-tailed Flycatcher; also Frugivorous birds, such as Quetzals and various Tanagers...

'One of the pearls of the collection is a beautiful pair of Scarlet Cocks-of-the-Rock, finger-tamed and quarrelling to a minimum. The male, thanks to a careful diet of tomatoes and other appropriate food, has kept his brilliant deep red colour... They have already played at nesting, and hopes are high for a brood some time' ...The outstanding success of the season, however, was the breeding of two Yellow-winged Sugar-birds, which had been out of the nest a couple of weeks when I saw them. An excellent Racket-tailed Drongo, a tame European Robin, and Vermilion Flycatcher must also be mentioned.

'There are several very good collections... of waterfowl in New Jersey and in New England...

'...that of Mr J. Livermore, at West Redding, Connecticut,... is excellent, far the largest in America. All the more current species are represented, often by a dozen or more pairs. Among the rarest are Blue-winged, Ashy-headed, Red-breasted, Emperor, Orinoco, Ross's and Maned Geese, Coscoroba Swans, Baer's and White-eyed Pochards, Ruddy Ducks, Golden-eyes, Cape and Marbled Teal, Comb Ducks, Australian and South African Sheldrakes and Crested Ducks... The collection of Doves is very good including Plumed Ground, Grayson's, Bronze-winged, Galapagos, and many other species...

'A little to the North, at Litchfield, Dr. Dillon Ripley has gathered a very choice collection of waterfowl on a delightful little lake fed by a stream... He keeps... many ducks, including Baer's and White-eyed Pochards, and three rare and lovely Philippine Mallards'.

* * *

'At Milbury, Massachusetts, Mr J. Deeter, another farmer with a great love for, and a long experience with waterfowl, is doing exceedingly well. Last summer I saw there two nice young Ross's

Geese, bred from an old pair born at Clères and sent before the war to Mr C.S. Sibley who has unfortunately since given up birds'...

* * *

'I have kept for the end a remarkable establishment which during the last few years has become more and more familiar to me: that of Mr W.J. Mackensen, at Yardley, Pennsylvania... one hour out of New York. For some fifty years Mr Mackensen, alone in this country has managed to make a steady living out of his birds, mostly Pheasants, Peafowl and waterfowl..

'More than twenty years ago I went to Yardley to buy Geese, and when I came to live in New York I got in touch again with Mr Mackensen. I found him so utterly conscientious and reliable that I asked him to procure or to handle all the birds I acquire for Clères... I enjoy the proximity of Yardley during the part of the year when most of the birds I see are stuffed specimens, and frequent visits to the Mackensen farm are welcome diversions'.

(American Aviculture - 1949 (I Eastern Collections). March-April, 1949 Vol. LVI, 62-66.)

Mrs Erlanger's Cocks-of-the-Rock did eventually produce chicks which, however, do not appear to have survived. Though otherwise unrecorded in this magazine, this event is referred to by Jan van Oosten (1957, P.49).

'...I had unfortunately no time to visit Mr Thierry, near Oakland, who breeds a few of the rarer Pheasants and has several pairs of the White Eared Pheasant and Palawan Peacock-Pheasants, nor several other excellent breeders, but I saw at leisure the two largest collections in Northern California, both in the vicinity of Napa: Those of Mr R.H. Gibson, at St. Helena, and of Mr Claude Hooke, at the Circle H Ranch.

'Mr Gibson owns a great deal of land, mostly vineyards, and a very important wine business... There are all sorts of game birds... The most remarkable are Victoria Crown Pigeons, Vulturine Guineafowls, Siamese, Malay and Bornean Firebacks, White Eared Pheasants, Nicobar and Wonga-Wonga Pigeons and Mountain Witches. Many young have been reared, particularly Edwards', Blue, Brown and hybrid Blue x White Eared Pheasants.

'Away in the high hills and far from any town, the Circle H Ranch is beautifully situated among forests of Redwoods, California Laurels and other interesting native trees. The game farm is large and it contains the finest collection in America today... All the species of Pheasants kept in captivity to-day are represented.

among them the only pair of Great Argus in America and the last female Rheinart's Argus; an excellent pair of Imperial Pheasants, reared at Clères many years ago, which produced this year over a dozen young, two pairs of White Eared Pheasants, Satyr and Temminck's Tragopans, Germain's and Grey Peacock-Pheasants, Berlioz ("Bel's") and Horsefield's Kalijs. Three Ocellated Turkeys and dozens and dozens of Sonnerat's Junglefowl were also reared in 1949.

'Mr Hooks gathered this exceptional collection during the last ten years, buying the totality of the stock of the late Leland Smith, of Mr Howland and Mr F. Johnson, which were among the best in the country... I have just passed to him the presidency of the American Pheasant Society, and it could not fall into better hands'.

* * *

'Mr D.W. Rich, of San Gabriel, an experienced and keen veteran breeder, also possesses interesting waterfowl and Pheasants, among which Black-necked Swans, perfect Lineated and Horsefield's Kalijs, and Java Green Jungle fowls are conspicuous...

(American Aviculture 1949 (II Californian Aviaries. May-June, 1950 Vol. LVI, 5-8.)

'...I will end with a few words about Clères. Thanks to Mr F. Fooks' incredible energy and ingenuity, it has regained almost completely its pre-war standard. Despite the disturbance caused by thousands upon thousands of visitors, who are necessary due to the very heavy cost of upkeep..., a number of young blrds were reared last summer, mostly waterfowl, game birds, pigeons and parakeets. Among the more interesting species, I should like to mention five Red-breasted and four Greenland White-fronted Geese, the latter for the first time in captivity...

(Notes on European Aviculture, 1950 January-February, 1951 Vol. LVII, 5-8.)

'Co. P. Milon, who has spent four months on Kergelen Island during the the autumn and winter of 1950-51, has recently brought to Paris ten Kergelen Pintails *Anas acuta eatoni*. They all look, at this time of the year (June-July, like very small, dark, reddish female Common Pintails, the size of a Chilean Teal... Four of these... are now at Cleres, the others remaining at the Paris Zoo. No specimens of these southern Pintails had so far been seen alive about anywhere in the world outside of these southern islands'.

(First European Importation of the Kergelen Pintail. September-October, 1951 Vol. LVII, 1955-56.)

'...this fine species has always been scarce in European collections, where a few have figured now and then in the past, but never bred. In 1938 Mr C. Cordier brought to Clères and to Leckford less than two dozen birds caught, or reared from the eggs, in the Peten district of Guatemala. But at the end of the last war the only birds left in England were merely a couple of hens at the London Zoo.

'After the war Mr Cordier accompanied Dr. D.S. Mewill to the Peten, and they brought over a nice consignment, which was distributed among American zoos and a few game breeders. Two or three young have been reared in recent years at the Washington Zoo and at Mr C. Hooke's game farm near Napa, California, now closed. But the only real breeding success of these fine birds has occurred at the San Diego Zoo, where a very favourable climate as well as special and adequate care by the Curator of Birds, Mr K.C. Lint, make conditions particularly propitious'.

* * *

'There was a good stock of Ocellated Turkeys at San Diego when I last visited the zoo on 29th June, 1952. Besides the three breeding pens of a cock and three or four hens, five young birds reared in 1950 and five more hatched in 1951 make up a total of some two dozen specimens. About twenty chicks were lively and well, and others due to hatch. Mrs Benchley is determined to establish and propagate this most interesting species and to distribute her birds' offspring as widely as possible'.

(Breeding Ocellated Turkeys at the San Diego Zoo. July-August, 1952 Vol. LVIII, 148-150.

'After nearly twelve years of life in New York City, on the 16th floor of a Fifth Avenue building, I have moved to California as Director of the Department of History, Science and Art of the County of Los Angeles... Last summer I bought a small house in one of the many charming residential sections of this unusual city, which is really a collection of suburban towns'...

* * *

'I had, of course, to keep birds. Possibilities, however, were limited. I did not want to spoil the garden, and in town, noisy things, which might bother neighbours, are not allowed. At the north side of the garden, by the house, is a garage which I promptly turned into a bird house. Nearby, a large window of the sitting-room looked on to a narrow (10 feet) passage of drab bricks. This was transformed into an aviary... 12 feet high, 24 feet long, and including the slice of the garage used as a shelter, 20 feet wide...

This... aviary has a population of finches, one or two pairs of most of the Australian species; Lavenders, Ruddies, and Cordon-bleus; Avadavats; Auroras; Rainbow Buntings; Red Hooded Siskins; Pintail Nonpareils, etc., about sixty altogether. There are also pairs of Painted Quails, Mountain Witch, Bartlett's, Silver Diamond, Talpacoti and Pigmy Doves; a Shama; Giant Whydahs; a pair of Bourke's Parrakeets, and a few Sugar Birds. When the housekeeper, who takes my place in the care of the birds when I travel, has sufficient experience, more difficult birds will be added such as small Tanagers and Sunbirds. As the garden is usually occupied by wild Humming-birds, it is not necessary to keep any in confinement where space is very limited...

'Along the fence following the first aviary is a similar one, 28 feet long, 10 feet wide. It contains a pair of Palawan Peacock-Pheasants; pairs of Harlequin Quails, Bleeding-heart, Ashy and Diamond Doves, Diamond Sparrows, Australian Crimson Finches, several varieties of Zebra Finches, Red-crested Finches, Cuban Finches, Indian White-eyes, and a European Song Thrush.

'There was an obvious location for another aviary between the bridge and the solid fence on the south side of the garden. It was only a question of roofing over the space between the bridge and on the sides. The result is a large flight, 50 feet and 20 feet, very high in the centre over the stream which flows in a deep gully. I keep there a few small ducks and teal, Mandarins, Puna and Sharp-winged Teal, Maned Geese, Lesser Indian Whistling Ducks; some Doves: Brush Bronze-wings, Cassin's, Peruvian Ground, Green-winged, Chiriqui Ground-Pigeons, and a few other birds such as Pekin Robins, Orange-headed Ground Thrush, Spectacled Jay Thrushes, a European Blackbird, Dyal Bird, Tricoloured Spreos, and Purple-headed Glossy Starlings.

'These Californian aviaries are few in number and small in size compared to those at Clères and, in the long past, at Villers. But they are suited to the present circumstances and very attractive, giving me much pleasure. At past sixty I am just as thrilled as ever by watching my birds, and I still enjoy caring for them as I did when I was ten years old. Bird lovers are incorrigible, I am afraid.

(My California aviaries July-August, 1953 Vol LIX, 111-116.)

'...With the passing away of Alfred Ezra, a happy, prosperous and delightful era has gone. I probably will miss him more than anyone else, as he was my best friend. But my sorrow is shared by many others, not only in England, but in France, and

the United States, and all over the world.

(In Memoriam - Alfred Ezra O.B.E. [Part]. September-October, 1955 Vol. LXI, 218-219.)

‘Among my new birds in Los Angeles are Fairy Bluebirds, Hooded Pittas and an Emerald Starling.

‘The breeding season at Clères was handicapped by Mr Fooks’ illness during the spring. However... many waterfowl bred, the most interesting young being 5 Andean Geese, 10 Philippine and 5 Hawaiian Mallards. The latter come from a pair which I had kept three years in Los Angeles without good results.

‘...I spent the months of March, April and June in South America, first with an expedition of my Los Angeles County Museum to Brazil, later on visiting Argentina, Chile, Peru, Ecuador and Colombia, in the company of Mr and Mrs Dillon Ripley, in the interests of the International Committee for Bird Preservation. In the course of this very interesting journey I had an opportunity to visit some collections of live birds...

‘...in the vicinity of Rio de Janeiro... Dr. E. Beraut keeps in a planted verandah a beautiful collection of Humming Birds, which he and his collectors obtain throughout Brazil. But the visit that I made with him to his friend, Mr F. Ruschi, at Santa Teresa, Espirito Santo (the state just north of Rio) will remain in my memory as one of the greatest thrills that I ever had. Mr Ruschi... knows birds as well as plants; his property contains museums, gardens and aviaries of the greatest interest. In particular he has built an enormous flight, 300 x 100 feet and 30 feet high, where hundreds of Humming Birds live and breed freely, including the lovely little Coquette. I saw fifteen on a bush, all reared by one original pair. There are about twenty local species in this aviary... Furthermore, a beautiful large (100 ft. long) house has been built, with a passage for visitors along its front, to accommodate the equatorial species from Amazonia which will not stand the cool nights of Santa Teresa.

‘Both Mr Ruschi and Dr. Beraut now entirely feed their Hummers on sugar or honey-water and on quantities of fruit flies. Even the difficult, mostly insectivorous, species of *Phaetornis* and *Pygmornis* do perfectly well on such a diet.

(Bird notes for 1956. January-February, 1957. Vol. LXIII, 19-21.)

‘...Sydney Porter was kind and unselfish, giving to his friends many rare birds brought over from his expeditions abroad or in his aviaries. For instance, he sent to Clères in 1934 a trio of New

Zealand Shovellers, a species which had never been imported before, nor has come again since; young were reared in 1935... This is but one example of his friendly generosity... .

(Sydney Porter (1900-1958) March-April, 1958 Vol. LXIV, 56.)

‘In the course of this year I retired from the position of Director of the Los Angeles County Museum, having reached the age limit of seventy, and I had reluctantly to move out of my California house. It was not possible to maintain it as I plan to stay there only two or three winter months each year, spending the spring and summer at Clères, and the autumn in New York, not to speak of many travels. I deeply regret leaving my garden and aviaries, as it was great fun to grow exotic plants and to keep birds in this wonderful climate. I had nine pleasant years in California and I am thankful for the experience.

‘Many of my Los Angeles birds have been sent to Clères, but the most delicate ones had to be disposed of over here, owing to an unwelcome one-month quarantine imposed by France on all birds from the United States and Great Britain because of Newcastle and other avian diseases prevalent at present in those countries. Obviously Sunbirds, Sugarbirds, Tanagers, Trogons, Cotingas, and other softbills could not have survived it. It was a bitter disappointment.

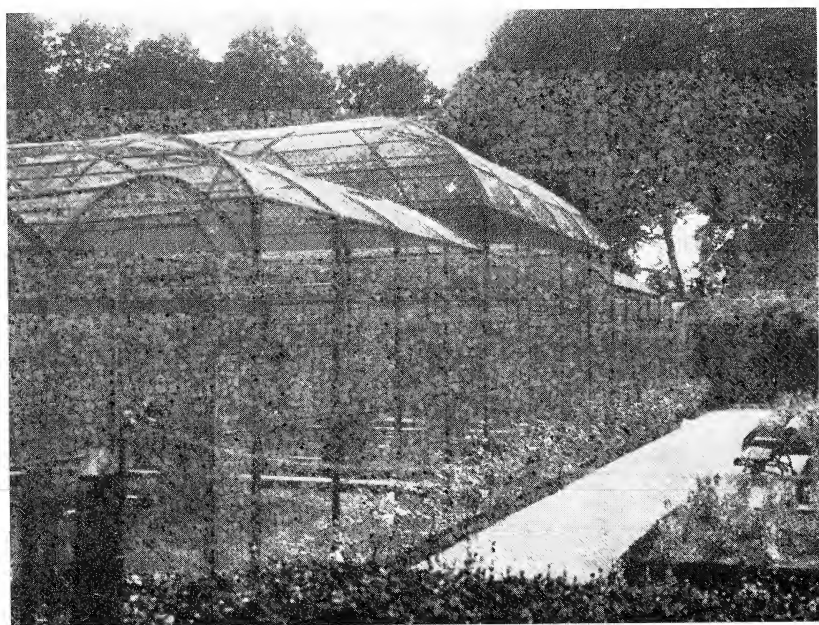
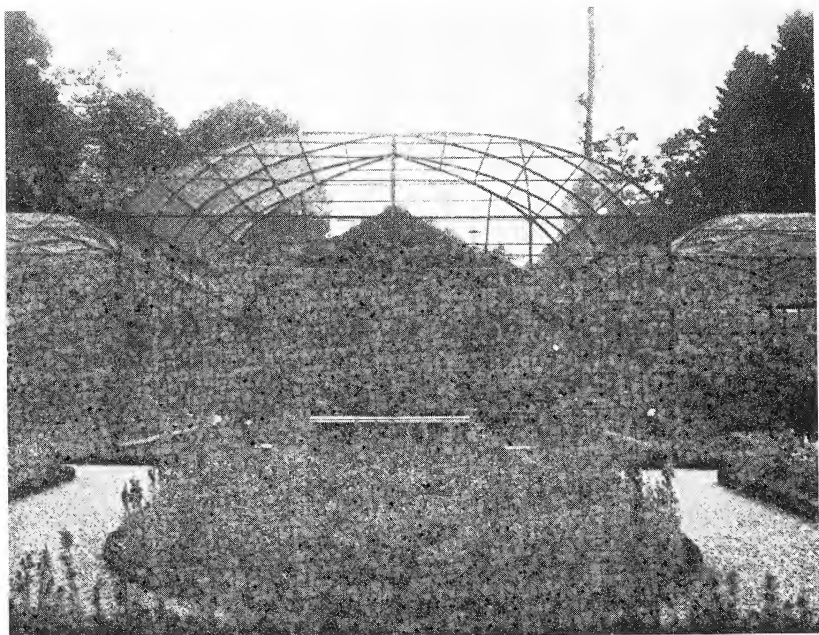
‘While California had one of the hottest and driest years ever recorded, Normandy was very wet, like the rest of Europe, which did not help in rearing birds. There were, however, at Clères... a number of Pheasants, including Mikados, Bel's, Brown Crossoptilons, Sonnerat's, and Ceylon Junglefowls... The most interesting waterfowl reared were two Australian Radjah Shelducks, Brazilian and Puna Teal... A pair of Hyacinthine Macaws laid eggs which did not hatch.

‘A number of important acquisitions were made during the year, the first being a pair of Congo Peacocks which the Royal Zoological Society of Antwerp most kindly loaned us. They looked perfect, but they have not laid yet. We received some good Congo birds from Charles Cordier: Hartlaub's Ducks, large Hornbills *Ceratogymna atrata*, Ross' and Schuetti's Touracos, Amethyst Starlings. Black and Plumed Guinea-fowls; White-eared and Knysna Touracos, Rufous Motmots also came, as well as a great many geese and ducks.

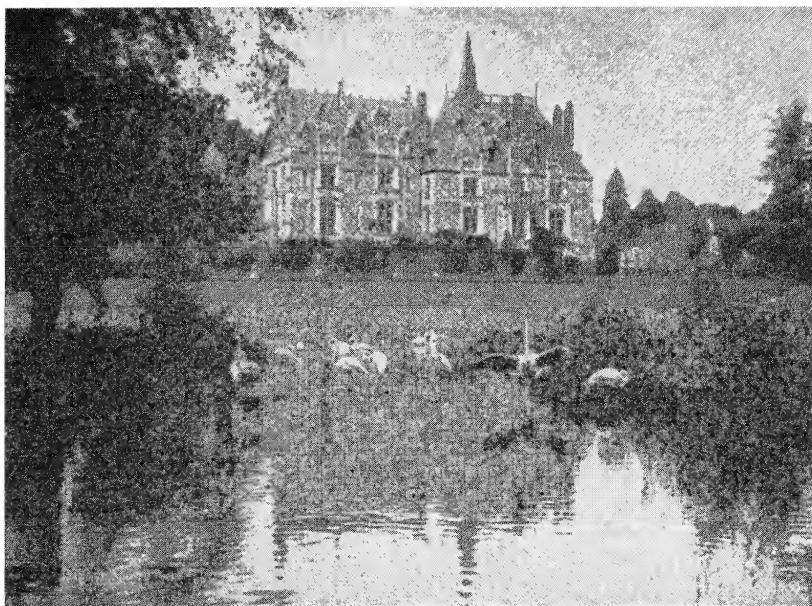
‘The aviaries for doves and small birds are now renovated and improved, and by the next spring, our collection of such birds will



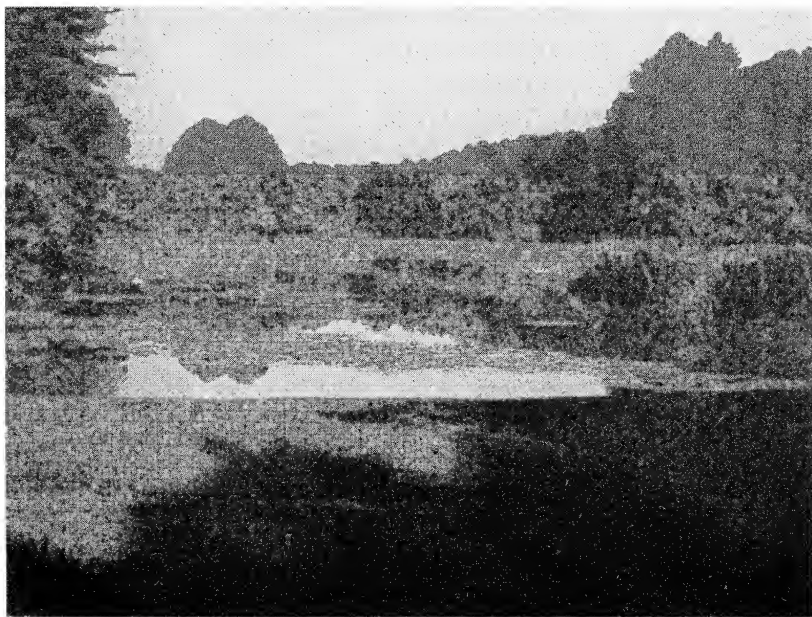
Captain Jean Delacour
Reproduced from 1940 Magazine



Aviaries at Clères
Reproduced from 1929 Magazine



Flamingos at Clères



The Lake at Clères
Reproduced from 1929 Magazine



American and European Flamingos at Dusk at Clères
Reproduced from 1936 Magazine

be greatly increased.'

(The birds at Clères in 1960. November - December, 1960 Vol. LXVI, 220 - 221.)

{The most attractive additions have been five European Bee-eaters. hand-reared from the nest. They are tame, they eat strips of lightly cooked meat, insect mixture and grated carrots, with only a few mealworms a day. They are in perfect condition, inhabiting a large indoor flight. There is also an interesting pair of Yellow-crowned Mynahs *Ampeliceps coronatus* and some Rothschild's Starlings'.

(Clères, 1962. September - October, 1962. Vol. LXVIII, 165 - 166.)

'One more of my old and dear friends has left us - taking with him more of my fond memories ... John Spedan Lewis, a Vice-President of the Society since 1939, died on 21st February, 1963.

'He had a very full life. We can only mention here the tremendous work he has done in expanding very successfully the large business he inherited from his father, and more so in turning it into a partnership thus presenting his employees with the large fortune he could have kept. Spedan Lewis' unselfishness and idealistic generosity have few, if any, equals in the world today...

'Spedan Lewis joined the Avicultural Society in 1924 and I met him at the Zoo the following year. He was then living at Hampstead, where he had built some excellent aviaries, with large heated shelters for rare passerine birds, particularly Birds of Paradise, and a few others. He also had a fine collection of wild cats in outdoor cages. He soon took great interest in owls and gathered a large collection of them, which were housed at Wargrave and cared for by Miss Ethel Chawner, a learned and enthusiastic naturalist, and long a specialist of these birds.

'He became a member of the council in 1927. When he left his house at Hampstead, he built a series of aviaries at Odney (Cookham), a park used as a country club by the John Lewis partnership. He acquired many more birds, including pheasants, a large number of them brought over by Messrs. Frost, Webb, Shaw-Mayer, and Cordier, sharing those collections with Ezra, Whitley and me.

'Spedan Lewis moved to Leckford, Stockbridge, Hampshire, in 1933, and Miss Chawner followed him. Great developments soon took place. With my advice, many very spacious pens for pheasants were erected up on the hill, and they were as good as any I have ever seen; also a large duckery was established in the valley on fast-

running chalk streams and ponds, in a perfect location. There were furthermore, roomy pens for swans, geese, and cranes. Excellent collections of all these blrds were gathered, many of them bred at Clères...

'Spedan and I had great fun planning this accommodation. We had become close friends through the years and saw a lot of each other in England and in France. He was also a benefactor of the London Zoo, presenting many rare species, and of the British Museum, several expeditions being sponsored by him.

'A livestock department had been opened at Peter Jones, one of the London stores of the Partnership, in 1938. It was soon closed down, but a fortunate result was that Mr. Terry Jones, who had been engaged to work in it, was then sent to Leckford... when Miss Chawner, a great friend to him, was obliged to curtail her activities, he assumed full responsibility for the collection... The Leckford collection was at its height when war was declared. Mr. Jones joined the Navy. It became more and more difficult during the following years to feed and care for the birds. Many were disposed of, particularly the cranes, but a good many species of waterfowl and pheasants were preserved. It was lucky as European, and even American, collections were replenished... from that valuable nucleus'.

(Obituary. John Spedan Lewis 1885 - 1963. May - June, 1963 Vol LXIX, 128 - 129)

'I had wanted for years to have a glimpse of New Guinea... My age does not allow me any longer to go on tiring and difficult expeditions, as I used to in the past... Therefore a quick visit to Sir Edward Hallstrom's Station at Nondugl [sic], in the Whagi Valley of the Central Highlands, was a perfect opportunity. Sir Edward's health last November did not permit him to come with me, but he kindly aranged for my visit. I flew to Port Moresby, an insignificant town among the dry hills of the coast, and soon a small, old plane (DC3) was to take me to Goroka. However, landing there was prevented by a storm, and I found myself at Madang, on the east coast, which is hilly, lush and attractive. But soon a six-seater flew me to up to Goroka, over the high mountains. The other passengers were all native Papuans, in local dress - that is to say a small belt, shell or bone face ornaments, and feathers in the hair... Another little plane took me over a range to Minj, some 20 miles from Nondgul [sic], where I was driven by landrover along a difficult road, as the wide valley is cut up by ravines such as I had never observed elsewhere. I was welcomed by Mr. Fred Shaw Mayer, the

well known collector, whom I have known well for many years. He had brought over, in the thirties, year after year, magnificent birds from New Guinea and the neighbouring islands for my late friends Herbert Whitley, Alfred Ezra, and John Spedan Lewis, and also for me. He now manages Sir Edward's property in New Guinea. I was glad to spend four days with this old friend and to talk of the past, as we have so many common memories'.

'Mr. Shaw Mayer has laid out the grounds at Nondugl with great skill and taste, and besides the numerous aviaries, there are several large ponds, beautiful trees and shrubs, and orchids...'

'The aviaries number nearly one hundred and consist of four well-spaced rows of ten compartments, each of the proper size for a pair of Birds of Paradise and of several groups of bigger ones. All have large shelters at the back, and are very heavily planted, except for a few containing Parrots and Birds of Paradise particularly destructive to vegetation; some are very large...'

'Birds of Paradise predominate in the Nondugl Collection. There were, in November, 1962, about 160 of twelve species; Salvadori's, Finsch's Lesser, Blue, Ribbontail, Stephanie's. Meyer's, Sicklebills, Carola's Six-plumed, Lore's, Wattled *Loboparadisea*, Ring, Hunstein's Magnificent, King of Saxony's. I had never before seen the latter alive; there were several males adorned with the tremendously long, horny head feathers. Four species have successfully nested at different times; Blue, Lesser, Ribbontails, Stephanie's; the last two having also produced hybrids. To this must be added Salvadori's. Three young, plumeless males and several females live in a large planted flight, and there was a nest. Mr. Shaw Mayer so far doubted that non-adults could breed, but we looked into the nest; there were newly hatched chicks in it!

'I had never seen before anything like the Nondugl aviaries and it taught me a great deal. It appears to me that the usual treatment of Birds of Paradise in Europe, and in the United States, is wrong. Their cages are too small; they are given too much heat; they are overfed. They should be in large, outdoor aviaries, well protected from winds, with a large shelter at the back kept just warm enough (40 to 50 degrees) during the coldest days. Indoor cages in hothouses are unsuitable... The more space the better. The food they receive at Hondugl consists, in the morning, of a mixture of mashed papaya and banana (10 per cent of the latter), crushed dog biscuit and fresh ant eggs. This food is eaten by mid-day, when the birds are given plain fruit, mostly papaya and any available berries.

Only a few (six to ten) mealworms a day; no meat. When ant eggs and papaya are not available, comparable ingredients can be used but, on the whole, this is a very satisfactory diet...

'There are other interesting birds at Nondugl; Pesquet's Parrots, Green-winged King Parrakeets, Eclectus, *Opopsitta*, a Long-tailed Buzzard *Henicopernis*, Victoria Ground Pigeons and lovely little Salvadori's Ducks, three of which were brought in when I was there

'Young were reared a number of times in previous years on the large, natural ponds of the garden. Mr. Shaw Mayer found them very pugnacious and one pair only could be kept on each pond. Clutches always consisted of three eggs.

'While I was at Nondugl, native men and boys were constantly coming in, sometimes large parties, to bring ant eggs and other insects, fruit and berries, and sometimes birds. It always was exciting and it reminds me of the good old days in Indo-China...'

(Notes on Austral and Southern Pacific birds IX. - New Guinea. November - December, 1963 Vol. LXIX, 2312 - 2324.)

'Too few people, in other countries, realize that some of the best collections of live birds existing at present are located in Northern Italy. It has been my privilege to visit a few of them recently with my old friend Professor A. Ghigi, whose series of pheasants, at Bologna, still count among the best in the world. Some forty Hume's Bartails, eight Satyr Tragopans, and many others have been reared in 1965 in his aviaries, and he possesses such unusual species as Malay Crestless and Sumatran Firebacks, Argus, Ocellated Turkeys, and White Eared Pheasants. It is always a great pleasure to stay with him, as I have done for so many years. At the age of 90, he is just as active as ever, and we did not waste much time during the four days I spent at his fine villa on the hills above the old city...

'Dr. P.F. Callegari has a big garden in the suburbs of Ravenna, where he and his brother keep a large and unusual collection of birds as well as a few mammals. Let us mention of the latter a family of Lesser Pandas, with young born there, and a tame Great Anteater which positively astonished me! He was curled up in the fork of a large tree about 30 feet above the ground! I had no idea that these large Anteaters were climbers - its owners stated that it went up every morning, sleeping the whole day there, coming down to feed in the evening, and spending the night indoors.

'The most difficult birds live in perfect condition in the Ravenna aviaries. There are... some... birds at liberty in the

grounds, including a beautiful pair of African Jabirus [**Saddle-billed Storks**]. Close to the house are many large moveable cages, about 6 x 4 feet, which contain various insectivorous and fruit-eating birds, several species of Kingfishers, Trogons and Tanagers, a number of other seldom seen species, and best of all, a dozen Bee-eaters, among them the beautiful Carmine *Merops nubicoides*, and the Pigmy *M. pusillus*, besides European *M. apiaster* and *M. bullockoides*, all in perfect condition. A pair of small Wood Hoopoes were particularly attractive. These cages are brought into a large hall during the winter. In September, a few birds were kept there and two hand-reared Nightjars were its most exciting denizens. Lots of live insects are reared and collected to feed all these birds, hard to keep as a rule.

'There is in the garden a roomy greenhouse with indoor compartments and outdoor flights, full of rarities. Pied Kingfisher, Rollers, Quetzals, etc., and many large aviaries. Several shelter interesting birds of prey and pigeons, others almost a complete collection of European Waders, particularly Snipe and three Woodcock, tame and in perfect condition after over three years in captivity... But perhaps the best of all is a large-domed one, with an extensive pond of running water (perhaps 30 x 15 feet) where Mergansers and, more particularly, Great Crested Grebes are kept in excellent shape, living there for many years. The secret of such an unusual success is the fact that no fish, particularly cut-up fish, is ever thrown into the pond, but are placed in a small catching basin where the overflow from the pond falls and runs out continually. In that way, no fish oil can pollute the water in which the Grebes swim. Otherwise they would have their feathers oiled and soiled, and then die quickly...

'Dr. Roberto Bucci lives at Faenza and there are two collections that he has gathered. One is in the town's public park, where Dr. Bucci has generously built fine accommodations... His home, outside the town, is surrounded by a fine park... There are all the existing species of Flamingos. Along one side are numerous aviaries containing many species of pheasants, small birds, doves, pigeons and parrots. I noticed among the latter a beautiful pair of Spix Macaws, four Queen of Bavaria's Conures, and several rare species of Pyrrhura. Dr. Bucci has business interests in Brazil and brings some birds from that country...'

(Some Italian Bird Collections, November - December, 1965 Vol. LXXI, 187 - 189.)

A first period of nearly a half century of the history of the park

at Clères, has just ended. Frank Fooks, its director for many years, died on 27th January, 1967, after a long illness.

‘Born at Briantspuddle, Dorset in 1892, Fooks came to Clères in the spring of 1920, as I was settling down in the Château. Seriously wounded in action in France during the First World War, he had worked for some time at the livestock department at Derry and Toms in London. Before the war, he had kept and reared birds which he loved as a boy.

‘At Clères, Fooks at first attended to the animals and birds, and, after a few years, he took charge of the whole property, which became the unique object of his interest and devotion. It is because of his great efficiency and reliability that I was able to leave every year on expeditions to Indo-China and elsewhere, and to travel extensively... He was a master at keeping and rearing birds, and also a perfect agent to run the estate’.

* * *

‘His loss has been a terrible blow to me after forty-seven years of close association and friendship.

‘Dr. P. Ciarpaglini, a veterinarian and an assistant at the Paris Zoo, has come to succeed him, and I have taken measures so that the Château and the Park will go, after me, to the Museum National d’Histoire Naturelle and the Department of the Seine Maritime. It is the only hope to perpetuate what is perhaps the last of the larger country homes adorned with an extensive collection of birds and park animals, such as we knew a number in Europe before the war, which have since vanished. I therefore trust that all the years of incessant labour that Frank Fooks has devoted to Clères will not have been in vain. To me, it never can be the same without his presence’.

(IN MEMORIAM - Francis E. Fooks 1892 - 1967. March - April, 1967. Vol. LXXIII, 45 - 46.)

‘Today, air transportation has changed the picture entirely. Native trappers in remote parts of the world can despatch their catches easily by aeroplane and the flights are so fast that even very delicate birds can be left unattended until they reach their destination. Innumerable species which had never before been seen outside of their native countries, many beautiful and unusual: Humming Birds, Sunbirds, Quetzals, Tanagers, Cocks of the Rock, etc., are frequently exported in numbers - in fact, they have been captured far too much; the early losses have been tremendous by lack of careful and knowledgeable handling and restriction of such activities is urgently needed. As a result of this new situation, the

great harbours and bird shops of such as London, Liverpool, Marseilles, Le Havre, Antwerp, Rotterdam, Hamburg, Genoa, have been closed. and the new ones are found in the vicinity of the main airports.

‘As circumstances have changed considerably, so have the bird collections; very few large private ones remain, while numerous new zoos, large and small, open to the public, have appeared, particularly in England and in France. Several of these maintain very good bird collections. Keen bird keepers and breeders, however, who maintain comparatively small numbers of rare and difficult species, very well housed and cared for, are even more numerous than they used to be, and they carry on with the same skill and enthusiasm the work of their predecessors’.

‘It is interesting to note that, as time passes, bird-keeping is gradually becoming less difficult...’

‘Avicultural Societies, of which there are only a few in the world, ours being the most important, are probably more prosperous today than at any previous time. This is mostly due I believe, to the greatly increasing interest of the public in general in natural beauty, and birds stand at the top of the ladder. It seems to be one happy result of a sad human situation: the artificial, cramped, distressing conditions of life of so many city people make them crave for trees, flowers and birds. It contributes to the increase of our membership’.

* * *

‘In my early days, orthodox ornithologists considered aviculture just as a nice hobby, and it was generally accepted that the observation of confined birds was scientifically worthless. Captive animals were supposed, as a result of a lack of knowledge, not to show the greatest part of their natural behaviour patterns. I am happy to state that a complete change of opinion has since taken place. Perhaps, in a small way, I have contributed to this favourable reversal, as a good deal of my ornithological work has been based on the study of captive birds, even those of a systematic nature. My friend Konrad Lorenz, probably the best ethologist of our time, has done more than anyone else to make aviculture a recognised scientific endeavour.

‘Practically all his remarkable work has originated in the observation of captive birds as well as other forms of animal life. We both started very young as enthusiastic bird lovers and keepers; neither of us have any reason to regret it. Aviculture at present, has

grown to be altogether a delightful kind of sport, from which great aesthetic pleasure and satisfactory interest is derived, as well as a very important technique of Biological Science, as it is necessary process for study. Also, it constitutes an important step in the preservation of the threatened species by their controlled propagation'.

(The progress of aviculture during the last three-quarters of a century. November, 1969 Vol. LXXV, 224 - 22s.)

REFERENCES

- LINDHOLM, J.H. (1988) Captain Delacour at the Bronx (1941 - 1947) *Avicultural Magazine* Vol. XCIV, 31 - 55.
- VAN OOSTEN, J.R. (1957) Adventures with softbills. *Ibid.* Vol. LXIII, 46 - 50.

ACKNOWLEDGEMENTS

I am most grateful for the assistance of Linda Coates, Librarian of the Zoological Society of San Diego, and Steve Johnson, Librarian of NYZS/The Wildlife Conservation Society.

* * *

BREEDING THE GREAT-BILLED PARROT

By Neil O'Connor (Coulsdon, Surrey).

The Great-billed Parrot, *Tanygnathus megalorhynchos*, was little known on the British avicultural scene until 1987 when a sizeable consignment was imported. Little has been heard or written about them since that date and no breeding results have been reported. When first imported they were advertised at around £1,000 per pair but owing to lack of interest and demand, the price plummeted fairly rapidly. They are now rarely available. It does seem a pity that more effort was not made by parrot enthusiasts to breed this very lovely bird in captivity particularly as it is unlikely that many more will be imported.

The Great-billed Parrot has a wide distribution in the islands of Indonesia and is also found in West Iran and in one of the Philippine islands where it is assumed it was introduced. It would appear that many of the various island races have minor distinctive colour differences.

My present pair were purchased in March 1992 and from the beginning showed every sign of incompatibility. The hen was the dominant bird and whenever I was in the proximity of their aviary, she persistently biffed the cock with her beak at the same time making threatening croaking sounds. The cock was never seen to defend himself and fairly rapidly made off from her unwelcome attentions. They always roosted in the shelter but never side by side - always several inches apart.

The flight in which they are housed is 12 feet long by 6 feet high by 3 feet wide. The shelter, open fronted, is 3 feet long. Their nest box, which is in the shelter, is 20ins. x 12ins. x 9ins.

In mid May 1993 the cock was seen several times going through the motions of regurgitation whilst alongside the hen but no transference of food was witnessed.

On 18th May the hen was in the box at feeding time. She emerged but re-entered the box within a couple of minutes. Inspection on 19th May revealed one egg. A second egg was laid four days later on 23rd May and the cock was seen feeding the hen on the same day. On 17th June, 29 or 30 days after the first egg was laid, the sound of young was heard. On 18th June, the hen was out of the box at feeding time. Inspection revealed one chick and pecking was heard in the second egg. Mid afternoon on 19th June, the hen was again out of the box. A quick inspection revealed that

the second chick had arrived. Both chicks were alive and well on 20th June. The next opportunity to inspect the box came on 24th June, when sadly the younger chick was found dead. Its crop was empty and it is likely that it had been dead for some days.

The birds were fed on sunflower seed and a mixture of three parts canary seed and one part each of hemp, wheat and oats. A vegetable mix of chopped carrot, peas and sweetcorn was also supplied.

Following my usual practice, all hard seed was withdrawn a few days before the eggs were due to hatch and supplanted by soaked sunflower together with the aforesaid vegetable mix, both dusted with a proprietary nutritional powder. Many years ago, I lost a baby Muluccan Cockatoo, incubated and reared for five days by a hen *Eclectus*, its crop packed with canary seed. Since then, no hard seed is given until the young are at least three weeks old.

When the young Great-billed arrived, it was noticed that most if not all the chopped carrot and peas were left in the food pot. After a few days, the sweetcorn content was increased and the other two ingredients decreased. The carrot and peas seemed not to be touched. I continued with this mixture for a few more days, all the sweetcorn was eaten but I was not certain whether or not some of the carrot and peas had been eaten. A mixture of sweetcorn and chopped apple was then given, together with six peas and six pieces of chopped carrot. On the following day, the pot contained six peas and six pieces of chopped carrot, the rest had been eaten.

On 29th June, when the chick was 13 days old, it was completely bare all over its body, not a hint of down. No sign of any feathers beginning to erupt. At 18 days old, down was starting to grow on its rump. One eye was open.

Mid afternoon on 11th July, all soaked sunflower had been eaten but the fruit and vegetables had not been touched. It is usually mostly consumed at this time of day.

The chick's crop was almost full. Sunflower was put in the food pot and both birds quickly ate it and the hen re-entered the nest box. Later that evening, the hen was out of the box. the chick was very noisy and its crop was empty. It was taken out for hand rearing. It ate ravenously and made no sound when gulping the food as do cockatoos and African Greys. It was 25 days old and had pale grey down on its rump, paler down on its breast. Its head and cheeks were completely bare and pin feathers were erupting on its wings. The mandibles were a rich orange.

At five, weeks old the wings were well covered in dark sheaths

and green feathers had emerged from sheaths on its shoulders. The head was darkening in colour. At six weeks old, green and yellow tail feathers were emerging. A few days later, hints of green were appearing on crown and cheeks and some yellow/gold on wings.

On 5th August, the cock was found dead on the food shelf, his right wing was almost severed at the shoulder. I have little doubt that this was a post-mortem injury inflicted by the hen. Another cock was purchased on 14th August, but more about that later.

When eight weeks old, bright blue feathers had appeared on the centre of the chick's back. The breast was olive green and its head and cheeks were well feathered. Its tail was 1½'' long. A week later it was transferred from the feeding box to a cage. It could roost comfortably on one leg.

On 24th August, when nearly 10 weeks old, it had been vomiting some of its food for a few days. An injection administered by a veterinary surgeon cured its crop infection and later that evening it ate avidly from the spoon. When 12 weeks old, it had been nibbling seed for about two weeks but not consuming very much. It had started vomiting again, was very thin and extremely noisy when hungry. On 11th September when it was 12 weeks and three days old, it was lying on the perch supporting itself in this position by its beak resting on a cross bar of the cage. It was removed from the cage and was unable to stand. Its crop was still full from its feed some seven hours earlier. It died soon afterwards.

The new cock did not get a welcome reception from the hen when introduced on 14th August but this was as expected. Great-billed hens are quite definitely the dominant partners. No fighting took place as the cock offered no resistance and quickly sought refuge on another perch.

On 1st May, 1994, pairing was observed twice. The following day, the cock was seen feeding the hen. This pattern continued for some days and on 11th May, the hen was seen entering the nest-box. On 15th May, the hen did not emerge from the box at feeding time. On 23rd May, the hen was out of the box at feeding time and inspection revealed two eggs. One egg was much smaller than the other and later proved to be clear. On 13th June, one chick was seen in the box. The chick was regularly inspected but only when the hen was out of the box. The cock never entered the box nor was he ever seen to look into it.

On 10th August, when the chick was just over eight weeks old, it was seen roosting on the nest box entrance for the first time. It had a large flat crown like the cock as opposed to the smaller and

more rounded crown of the hen. On 25th August when it was ten weeks and three days old, it emerged from the box. Five days later, the chick re-entered the box and spent some hours there. This was the only occasion on which it was known to re-enter the box.

The chick was feather perfect, glowing with health and beauty. The hen was very attentive to her progeny and was seen to feed it regularly. The cock ignored it completely and was never seen to approach it.



Chick at six weeks old

When about 12 weeks old, the young bird was seen visiting the food pot. At 13 weeks, it was probably independent. It was a strong and accurate flier from the time it emerged from the box and permits closer human approach than either of its parents. It is also probably marginally larger than either of its parents but apart from that, the only noticeable difference is in the colour of its eyes, which are a dark brown, unlike those of the adult birds which have pale yellow irises. The black wing coverts which are edged with gold are no less colourful than those of its parents.

Sad though it was to lose the chick which hatched in 1993, the fact that it was hand-reared enabled me to make a detailed photographic record of its development.

INCUBATION AND HAND REARING OF ABYSSINIAN GROUND HORNBILL

By Jo Gregson

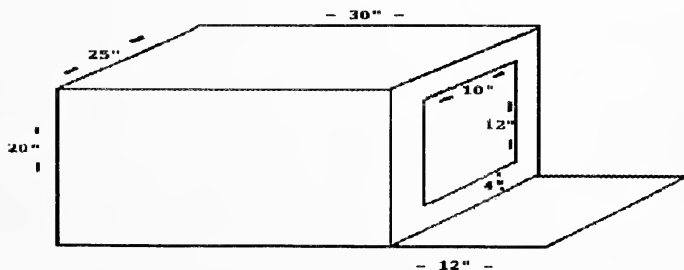
(Senior Head Bird Keeper, Paignton Zoological &
Botanical Gardens)

Despite its name, the Abyssinian Ground Hornbill *Bucorvus abyssinicus* ranges widely over most of central Africa from Gambia in the east, to Ethiopia in the west and extending south to Kenya and Uganda.

It is the largest of the hornbills spending most of its day on the ground hunting for small mammals, reptiles and insects, returning to trees only for the purpose of roosting at night.

Unlike other hornbills the pair do not seal the entrance of their nest cavity. Even so, the female rarely leaves the nest throughout incubation and the male supplies food while watching over the nest. Two eggs are laid four to five days apart. Incubation begins with the first egg, giving little chance for the second hatchling to survive.

The Paignton pair of hornbills are kept in an aviary comprising an outside viewing area measuring 4 x 6 x 2 m. high, with off-show inside quarters 4 x 6 x 3 m. high. During early 1993 two nest boxes were placed in the house, one of which, a tunnel type, was placed on the floor and the other, of a more conventional shape was fixed



Nest Box

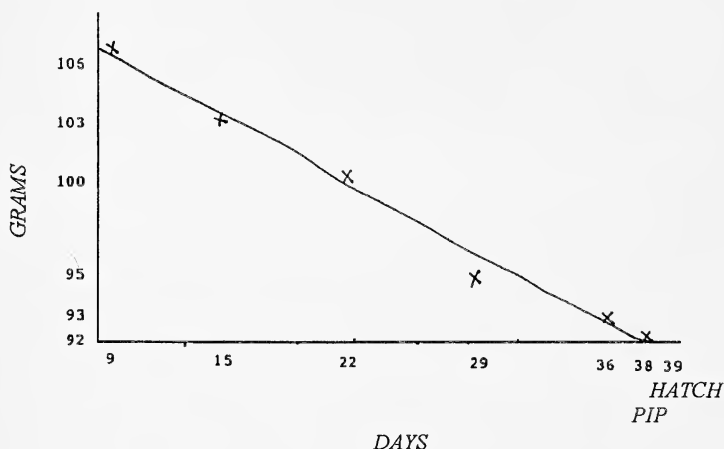
at a height of 2 m. Although interest was shown in both boxes the higher one was preferred. Dried peat was spread in the box while dried leaves and twigs were scattered for nest building.

Eggs laid throughout 1993 were always broken and so on 25th January this year two eggs were taken for artificial incubation.

The female had been sitting for eight days, both eggs were found to be fertile and were placed under a broody bantam. On day 36 they were transferred to a still air incubator set at 39.5° centigrade.

The smaller of the two eggs had begun to lose weight excessively by day 33, and despite an increase in humidity, a 20% weight loss had occurred by day 38. The chick was assisted from the egg on day 40, but unfortunately remained weak until its death at 5 days. A post mortem examination revealed a diseased liver.

The bigger egg pipped on day 38 and, hatched on day 39 with only a 13% weight loss. The chick's navel was dabbed with an antiseptic. After being left in the incubator overnight it was moved to a brooder set at 35° centigrade. Being blind, naked and helpless the chick was confined in a small tissue-lined tub.



Weight loss of Abyssinian Ground Hornbill egg incubated under bantam.

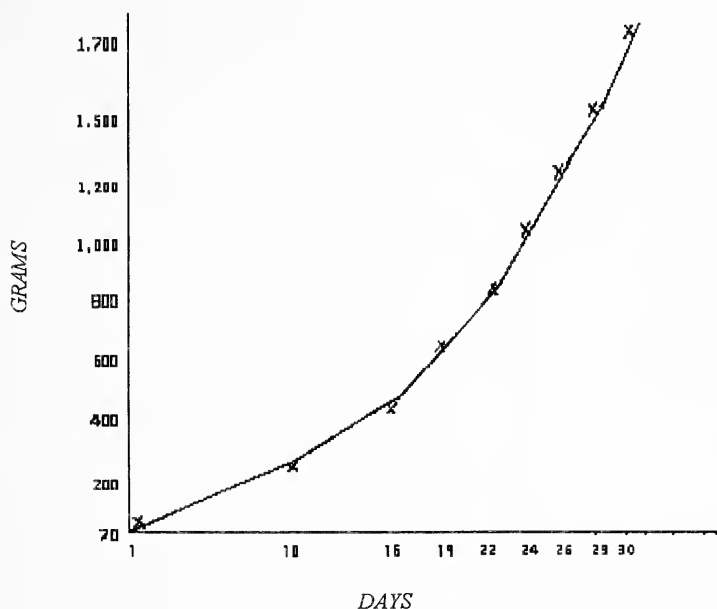
At first the task of persuading the chick to feed proved difficult, however learning was rapid and it soon settled down to a regular feeding routine.

The food consisted of finely chopped chick and mouse muscle seven times daily. After a few days, soaked Diet A (Mazuri Zoo Foods) was added once daily with a sprinkling of SA37 and much bone meal.

Soon after hatching, the chick's skin became dry and flaky. Rather than risking a fungal infection through increased brooder

humidity, petroleum jelly was rubbed onto the chick's skin once daily until the pin feathers were coming through. This worked well and further prevented the faeces sticking to the chick's rear end.

The temperature of the brooder was reduced by 2.5° on days 12, 20, 24 and 30. Pin feathers were showing and the chick's eyes began to open by the 11th day. Over the next 2 - 3 days, as the eyes opened fully, it became very vocal at feeding times.



Growth curve of Abyssinian Ground Hornbill

By day 24, whole mice were taken and the chick was moved to a larger plastic box. To prevent leg splaying, cardboard egg trays were placed under clean wood shavings.

By day 65 when feeding had been reduced to 3 times daily the chick was standing well, but still unsteady when walking. From that date it progressed very quickly and by day 80 was walking, running, learning to fly and was exercised in the grounds mornings and evenings.

During February the adult hen laid a second clutch which she sat for the full 39 days, unfortunately both eggs disappeared. At the time of writing (May 1994) a third clutch has now been removed for artificial incubation.

SOME THOUGHTS ON A VISIT TO BRITAIN IN MARCH 1954

By Marvin L. Jones (San Diego)

In March 1954 I undertook a tour of various zoological collections in Great Britain, which included a stop at Belle Vue Zoological Gardens (Manchester). There, Gerald Iles, the long-time Director, suggested that I might like to go on to London with him, and attend both a performance of Sadler's Wells Ballet (it was a Command Performance) and also go to the 42nd meeting of the Avicultural Society, of which he was a Member.

Zoological collections had been a hobby of mine for many years and in September 1951, as a member of the American Army, I arrived at the town of Bingen on the Rhine from where, over the next few years, I would visit many of the live animal collections of western Europe.

At the suggestion of Gerald Iles I joined the Avicultural Society and in the January February 1954 issue of the *Avicultural Magazine* an item was published in which I described the bird collection at the Cologne Zoological Gardens. Dr Wilhelm Windecker, Director there, had allowed me to use the guest room of that zoo from early 1952 and there I met many of the directors of other collections, so that when I travelled out I rarely stayed in hotels but rather in zoo guest rooms.

An unforgettable stop was at Chester with George Mottershead to see his vast collection of ivory carvings and hear his account of the creation of the then fast-building Chester Zoo, now the principal collection in the United Kingdom.

Thanks to Arthur Prestwich and the then Head Keeper of Birds at London Zoo, Alf Woods, I soon found myself busily visiting many private and public collections, reporting on them in the *Avicultural Magazine* or *International Zoo News*.

In December 1993 I retired after almost 19 years caring for the animal records at the Zoological Society of San Diego and have begun, along with Dr Nerbert Schifter of Vienna and Dr Koen Brouwer of Amsterdam, a series of papers on bird longevity. The first, on Storks, has been published in the *International Zoo Yearbook*. Forthcoming shortly will be the next on Ibises and Spoonbills, to be followed in order by Herons and eventually all of the other families of birds.

NEWS AND VIEWS

LOVEBIRDS RECOVERING

Tanzania's population of Fischer's Lovebirds *Agapornis fischeri* is believed to have the capacity to recover from the effects of the international wildlife trade, according to a new survey. Up to 50,000 of these birds were captured for export in the last decade, but tougher trade restrictions since the late 1980s have enabled numbers to increase slightly in the last two years. It is suspected, however, that Fischer's Lovebirds are being exported illegally as Red-faced Lovebirds *A. pullaria*.

Wildlife News

* * *

NEW COTINGA

First seen in southern Ecuador five years ago, the Chestnut-bellied Cotinga *Doliornis remseni* has since been observed elsewhere in Ecuador as well as in Peru and Colombia.

* * *

RECORD YEAR FOR KITES

Red Kites, reintroduced in the UK in recent years, have boosted a fragile population to such an extent that their best breeding season in recent times was recorded in 1994. Twenty eight pairs reared a total of 50 young. Through natural dispersion the species is beginning to be sighted in areas from which they had long since disappeared.

Dave Coles

* * *

GOOD YEAR AT LORO PARQUE

By November, some 470 specimens of 118 different species and subspecies had been reared in the collection at Loro Parque during 1994, the vast majority being parent-reared. Among the more important species reared were Cardinal Lory *Chalcopsitta cardinalis*, Mitchell's Lorikeet *Trichoglossus haematodus mitchellii*, Weber's Lorikeet *T.h. weberi*, Edwards' Lorikeet *T.h. capistratus*, Iris Lorikeet *T. iris*, Mount Apo Lorikeet *T. johnstoniae*, Leadbeater's Cockatoo *Cacatua leadbeateri*, Western Long-billed Corella *C. pastinator*, Moluccan Cockatoo *C. moluccensis*, Gang Gang Cockatoo *Callocephalon fimbriatum*, Blue-naped Parrot *Tanygnathus lucionensis*, Orange-breasted Fig Parrot *Opopsitta gulielmiterti*, Green-winged King Parrakeet *Alisterus chloropterus moszkowskii*, Horned Parrakeet *Eunymphicus cornutus*, Greater Vasa Parrot *Coracopsis vasa*, Lesser Vasa Parrot *C. nigra*, Ruppell's

Parrot *Poicephalus rueppellii*, Black-cheeked Lovebird *Agapornis personata nigrigenis*, Hyacinthine Macaw *Anodorhynchus hyacinthinus*, Blue-throated Macaw *Ara glaucogularis*, Red-fronted Macaw *A. rubrogenys*, Red-bellied Macaw *A. manilata*, Queen of Bavaria's Conure *Guaruba guarouba*, Blue-throated Conure *Pyrrhura cruentata*, Fiery-shouldered Conure *P. egregia*, Crimson-breasted Conure *P. perlata*, White-bellied Caique *Pionites leucogaster*, Yellow-naped Amazon *Amazona ochrocephala auropalliata* Double Yellow-headed Amazon *A.o. oratrix*, Lilac-crowned Amazon *A. finschii*, Vinaceous Amazon *A. vinacea*, Salle's Amazon *A. leucocephala ventralis*, Pretre's Amazon *A. pretrei*, Lilacine Amazon *A. autumnalis lilacina*, Yellow-shouldered Amazon *A. barbardensis*, Bodin's Amazon *A. festiva bodini* and Purple-bellied Parrot *Triclaria malachitacea*.

Roger Sweeney

* * *

LAYSAN TEAL DECLINE

A survey in 1994 on Laysan Island found only 38 adult and 15 juvenile Laysan Teal *Anas platyrhynchos laysanensis*. The subspecies is endemic to this small (370-ha) island which has only one lake on which the birds depend for food. The cause of the decline is not clear, although the lake's water level has fallen due to reduced rainfall which, in turn, has led to smaller numbers of brine flies on which the birds feed.

Wildfowl and Wetlands

* * *

BALD EAGLE RECLASSIFIED

The Bald Eagle *Haliaeetus leucocephalus* - the United States' national bird - is to be reclassified to 'threatened' from 'endangered' following the species' recovery. Since the late 1980s the species' breeding population in the 48 lower states has doubled to 4,000 pairs.

* * *

SADDLEBACKS REINTRODUCED

A group of 25 South Island Saddlebacks *Creadion carunculatus* have been reintroduced to the Marlborough Sounds. The birds, 10 males, 10 females and five juveniles, were transferred from two islands in the Titi group to Motuara Island in Queen Elizabeth Sound.

* * *

SAN DIEGO'S HARPY

Listed as 'endangered' in their habitat in the forests of Central

and South America, the successful hatching of a Harpy Eagle *Harpia harpyja* at San Diego Zoo in November 1994 was a significant event. The breeding pair laid two eggs and staff succeeded in removing the first of them for artificial incubation. Both adults shared incubation of the second egg which started to hatch on 18th November but the chick could not be found the following day. Meanwhile, the other youngster is thriving in San Diego's Avian Propagation Centre where food is offered by a lifelike hand puppet to prevent imprinting.

* * *

POACHING THREAT TO AMAZON

The Red-tailed Amazon *Amazona brasiliensis* is confined to a stretch of coast 250 km long and 30 km wide in Brazil's Parana and southern Sao Paulo states. Heavy poaching is causing the population to decline rapidly. There were 4,000 birds in 1989 but this number had fallen to 3,000 in 1992. Trapping continues while nesting cavities are damaged when nestlings are taken. Although the species is legally protected, enforcement is almost nil. Most of the parrots are smuggled to Europe and the USA and there is no proven record of captive breeding. It has been suggested that local fishermen and their families - who are the worst nest-robbers - should be offered economic incentives to act as unofficial guards, and that an education campaign, aimed at local people and started in 1992, should be extended.

Psitta Scene

* * *

AUK INVASION

Record numbers of Little Auks *Alle alle*, which winter in the waters of the North Atlantic, have been reported off Britain's eastern coastline this winter - probably blown there by severe westerly gales. During one day there were counts of nearly 10,000 off Flamborough Head (Humberside), 7,500 off Whitburn (South Tyneside), 5,000 off Hartlepool (Cleveland) and 4,700 off Seaton Sluice (Northumberland), while 6,800 were counted within an hour at Cullercoats (North Tyneside).

* * *

ROAD THREAT TO WADERS

Habitat which provides an internationally important winter refuge for up to 15,000 Avocets *Recurvirostra avosetta* and 75,000 Black-tailed Godwits *Limosa limosa* is under threat because of a proposed new road crossing of Portugal's Tagus estuary. Although the government is pressing ahead with the scheme, non-

governmental organisations are reported to have persuaded the country's President to oppose the plans.

* * *

INDUSTRIAL CHALLENGE REVEALS 250 SPECIES

As the 1994 BTO-Zeneca Bird Challenge for Business entered its final leg the British Trust for Ornithology revealed that nearly 250 species had been logged across 64 industrial sites. Sightings indicated that Britain is enjoying an unprecedented invasion of Little Egrets *Egretta garzetta* and there are hopes the species may soon breed in the UK. Owls were well reported but only one site (Shell UK at Stanlow) confirmed five British species - Tawny, Barn, Little, Long-eared and Short-eared. Although they were not eligible for inclusion in the challenge, observers reported a number of 'exotics' including Red-billed Weaver, Cockatiel, Budgerigar, Helmeted Guineafowl, Cape and Ruddy Shelducks, Chiloe Wigeon and Bahama Pintail.

* * *

PROTECTION FOR BUSTARDS

Spain's last remaining population of Great Bustards *Otis tarda* will receive protection following the establishment of the country's first steppe national park at Los Monegros in Aragon Province's Ebron Valley.

* * *

UK BARN OWL SURVEY

Volunteer fieldworkers have begun carefully searching the UK for Barn Owls *Tyto alba* as the world's most detailed survey of the species gets underway. The aim is to find out how many of these once common birds remain in the British countryside. The three-year survey is being run jointly by the British Trust for Ornithology and the Hawk and Owl Trust. It is the first nationwide survey of the species for 10 years.

* * *

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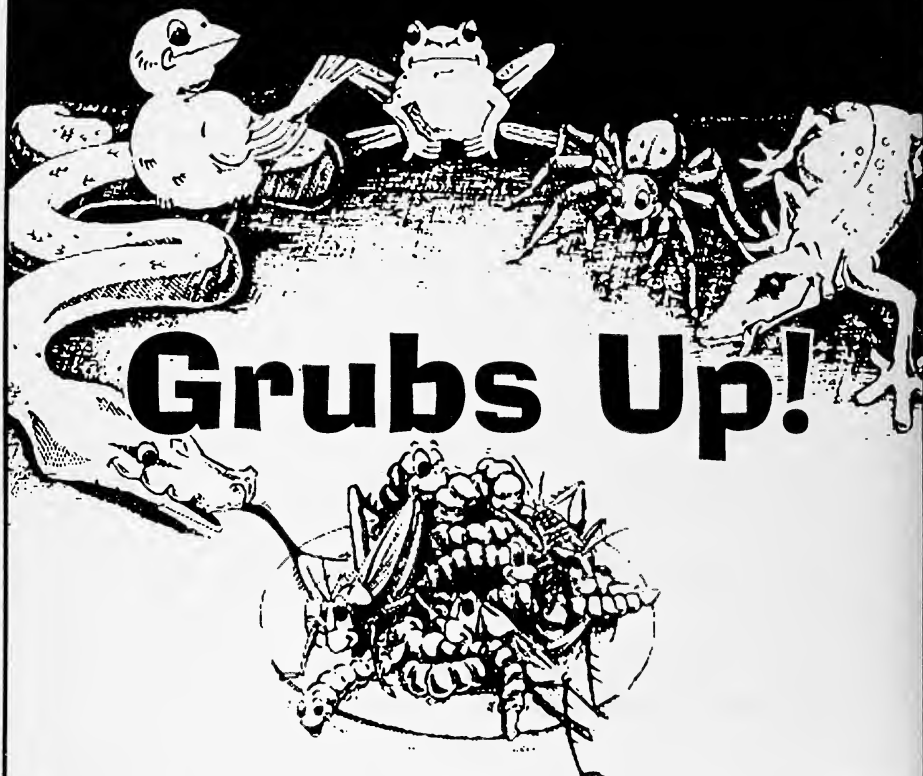
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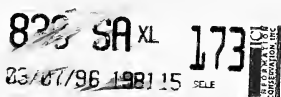
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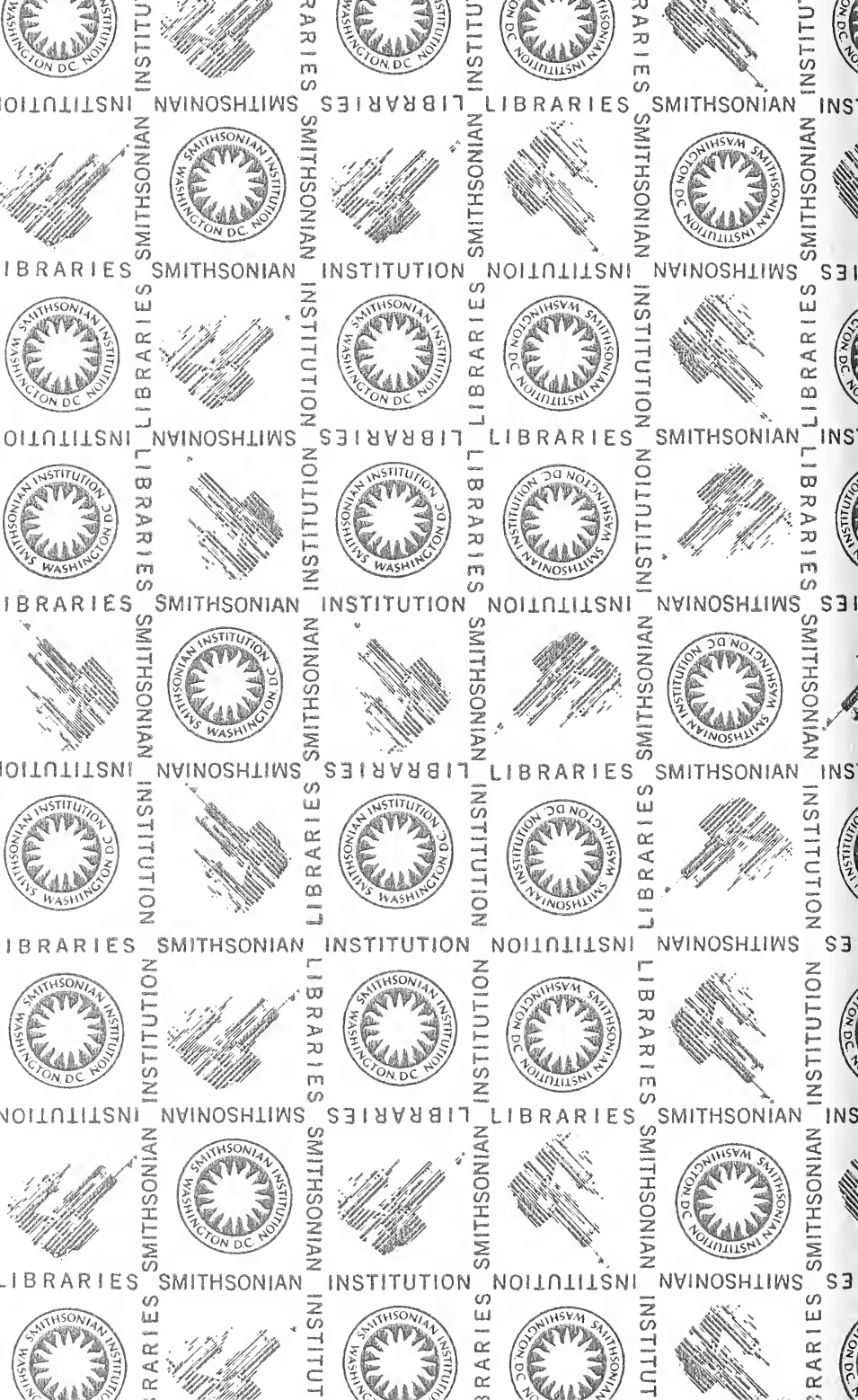
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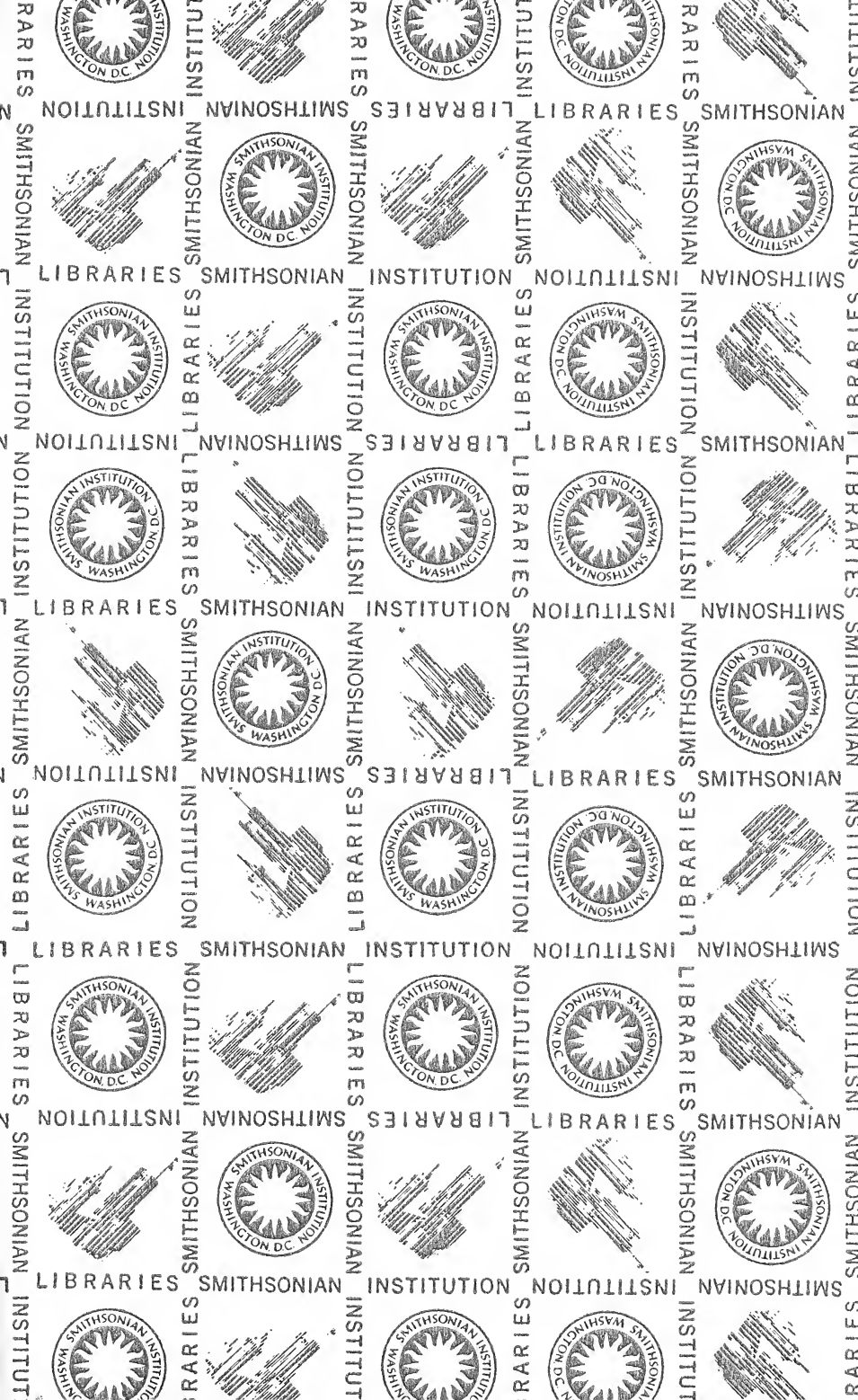
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